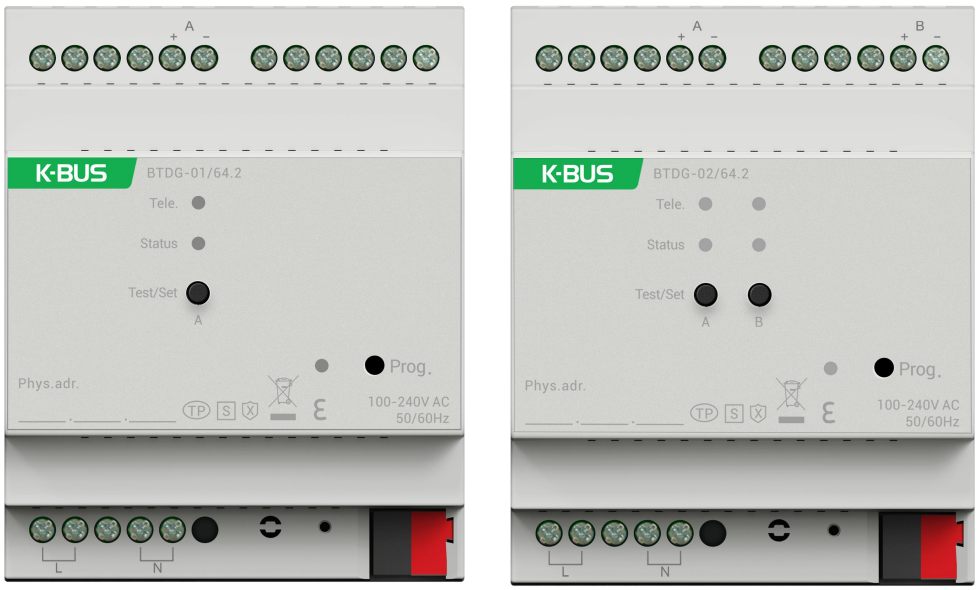
User Manual

K-BUS® KNX-DALI-2 Gateway, 1/2-Fold_V1.0

BTDG-01/64.2

BTDG-02/64.2



KNX/EIB Home and Building Control System

Attentions

1. **Please keep devices away from strong magnetic field, high temperature, wet environment;**

2. **Do not fall the device to the ground or make them get hard impact;**

3. **Do not use wet cloth or volatile reagent to wipe the device;**

4. **Do not disassemble the devices.**

目 录

Chapter 1 Summary

KNX-DALI-2 Gateway, 1/2-Fold is designed for KNX intelligent building control system and used to connect KNX bus and DALI bus. As the interface between KNX installation system and DALI network, messages from the KNX bus can be converted into information that can be identified by the DALI device via this gateway. The information contains the DALI device address and command, and send to the DALI network to control the DALI device, thus to realize the functions of switching, dimming, brightness value, colour temperature, colour control, etc. of various lamps etc. of various lamps with DALI ballasts, while the DALI gateway can request the status of the DALI device, failure detection, and convert the status and failure information into KNX telegrams, and send to the KNX bus.

KNX-DALI-2 Gateway, 1/2-Fold has two product types with 1-Fold and 2-Fold output. Each channel can connect up to 64 DALI devices. Each DALI device can be controlled by a direct switching, dimming, brightness value, colour temperature, colour control by using a KNX communication object. The assignment of DALI device addresses can be done manually or automatically. At the same time, we provide DCA tool for users to easily modify the address, test, and assign groups and scenes to the DALI device,etc.

Note: DCA is a App plug-in in ETS embedded in the application of the product. This manual provides detailed technical information about the KNX-DALI-2 Gateway, 1/2-Fold including installation and programming details, and explains how to use it in the practical examples.

1.1 DALI System Introduction

In the same DALI network, there are up to 64 slave units, each with a separate address (Short address). It is also possible to assign a slave unit to a group (up to 16 groups can exist at the same time). The host can also send information to all slave units. The main features of the DALI protocol: asynchronous serial communication, 1200 baud rate, two-wire differential signal, a DALI bus can be connected to 64 slaves, each slave can be individually addressed, not two-way communication at the same time.

1.2 Product and Function Description

KNX-DALI-2 Gateway, 1/2-Fold is a modular mounting device. For easy installation into the distribution box, it can be mounted on a 35 mm DIN-rail according to EN 60 715. The device is screwed to the electrical connection and the bus connection is directly through the KNX. Connect the terminal block and input the power supply voltage of 100~240V AC. For the assignment of physical addresses and parameter settings, the engineering tool software ETS (version ETS5.7.7 or higher) with the .knxprod file can be used.

The main functions of the KNX-DALI-2 Gateway, 1/2-Fold are summarized as follows:

- One/Two output channels, 64 DALI devices per channel, each DALI device can be individually switching, dimming, set brightness value, colour control, etc.
- Multiple device types are available, such as DT6-LED dimming control device, DT8-colour control device, colour control type including RGB Colour, RGBW Colour, XY Colour, Colour Temperature
- Group control: up to 16 different groups for each channel. Assign DALI devices to groups via the DCA. And switching, dimming control, colour control for each group
- 16 different DALI scenes for each channel. And the brightness value of scenes are configured by the DCA
- Group scenes or global scenes in DALI channels can be recalled via KNX scenes
- Broadcast control: switching, brightness, colour temperature, colour control for all DALI devices of a channel
- Operation mode: support normal mode, normal/night mode, staircase mode, permanent mode, burn in mode
- 8 behaviour templates for group and ECG action setting and a ECG configuration which can be modified by the DCA
- Send or response various status, such as switch, brightness, operation hours etc.
- Fault detection of lamps and ballasts for DALI devices
- Monitoring DALI bus voltage, DALI bus current and DALI bus short circuit status
- Support the KNX Data Secure

Chapter 2 Technical Data

Power Supply	Bus voltage	21-30V DC, via the KNX bus
	Bus current	9.5mA/30V DC 11.0mA/24V DC
	Bus consumption	< 285mW
DALI Output	Voltage	100~240V AC，50/60Hz
	Current	<55mA, 220V AC
	Consumption	<12W, 220V AC
DALI Output	1/2 Channel	Max.64 DALI devices per channel
	Current	≤250mA, for per channel
	Load voltage	15~19V DC
Connections	KNX	Bus connection terminal（Red/Black）
	Inputs and output	Using screw terminals
Operation and display	Programming button and Red LED	Used to assign physical addresses
	Green LED flashing	Indicates that the device application layer is working normally.
	LED (Tele.)	Fast flashing indicates that the DALI bus is being initialized； Flashing during communication, indicating that there is received message data on the DALI bus； Permanent lamp indicates that DALI bus initialization is complete
	LED (Status)	The LED indicates that the entire channel switch is on, and the off indicates that the entire channel is off. It is only applicable to the channel A and B control indications and the channel's broadcast switch control indication (single channel device

		only A)LED flashes, indicating that the DALI gateway is initializing
	Test/Set button	Short press <5s: for on/off all DALI devices to test unconnected DALI devices; Long press >5s: reinitialize DALI bus
Temperature	Operation	-5°C...+45°C
	Storage	-25°C...+55°C
	Transport	-25°C...+70°C
Ambient	Relative humidity	<93%，Except for condensation
Mounting	Mounted on a standard 35mm DIN rail, DIN EN 60 715	
Size	72mm ×90mm ×64mm	
Weight	0.25KG	

Application	**Maximum number of communication objects**	**Maximum group address**	**Maximum number of associations**	Secure group addresses
KNX-DALI-2 Gateway,1-Fold/1.0	1902	2500	2500	1000
KNX-DALI-2 Gateway,2-Fold/1.0	3803	4500	4500	2000

Chapter 3 Dimension and Connection Diagram

Taking dimensional and connection diagram of the KNX-DALI-2 Gateway, 2-Fold as an example, and the 1-Fold only retains channel A.

3.1 Dimension Diagram

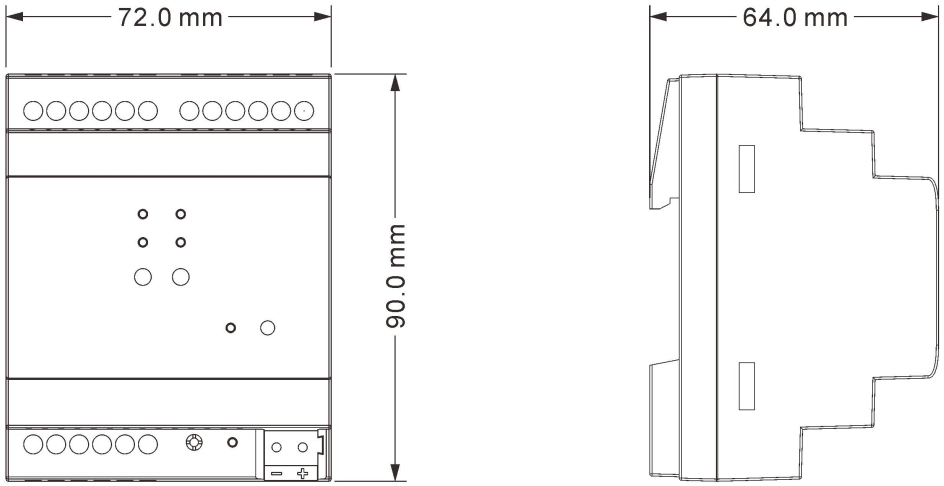


Fig.3.1 Dimension Diagram

3.2 Connection Diagram

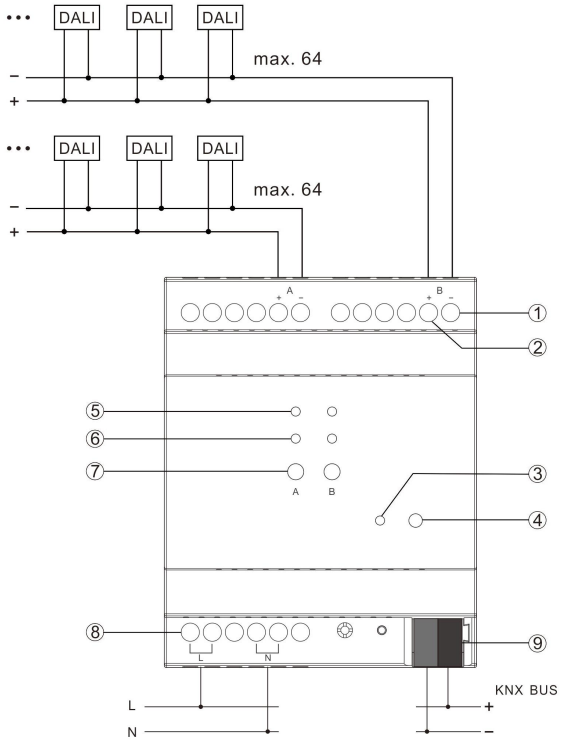


Fig.3.2 Dimension Diagram

① DALI output negative pole

② DALI output positive pole

③ Red LED indicates programming the physical address;Green LED flashing indicates the application layer works normally

④ Programming button

⑤ LED (Tele.):

Fast flashing indicates initializing DALI bus;

Flashing during communication, indicating that there is received telegram data on the DALI bus;

Permanent on, indicating that DALI bus initialization complete.

⑥ LED (Status)

LED on indicates that the entire channel switch is on, and the off indicator indicates that the entire channel is off. It is only applicable for the control indication of channel buttons A and B, and the switch control indication of channel broadcast.

LED flashing, indicate that the DALI gateway is initializing the configuration.

⑦ Test/Set button

Short press <5s:for on/off all DALI devices to test unconnected DALI devices

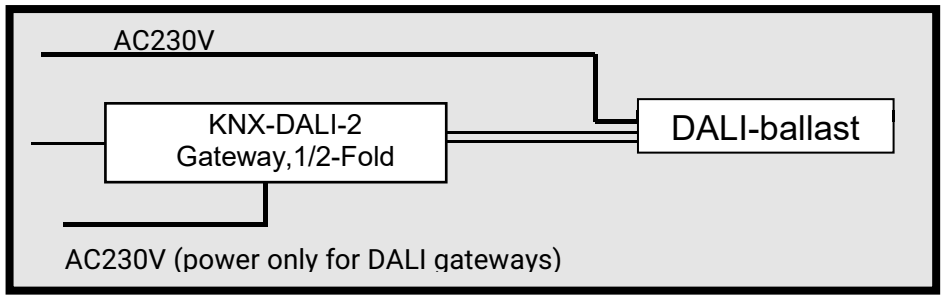
Long press >5s: reinitialize all devices on DALI bus or initialize the DALI devices without a DALI address or no action, according to the parameter “Test/Set button function via long press(>5s)” setting in section 5.2.

⑧ 230V AC auxiliary power input

⑨ KNX bus connection terminal

Chapter 4 Project Design and Application

4.1 Schematic



4.2 Overview of Functions

4.2.1 Control of a Single DALI Device

In the KNX-DALI-2 Gateway, 1/2-Fold application, each DALI device for each output channel can be individually switching, dimming, brightness value, colour temperature, colour control by an object, and the the switching, dimming, brightness status, colour temperature, colour control status can be requested. Such as:

Output X ECG y — Switch （switch control for device y）

Output X ECG y — Relative Dimming （relative dimming control for device y）

Output X ECG y — Brightness value （brightness value control for device y）

Output X ECG y — Relative (percentage) colour temperature

（Relative (percentage) colour temperature e control for device y）

Output X ECG y — Absolute colour temperature （Absolute colour temperature control for device y）

Output X ECG y — RGB colour /HSV Hue(H)/HSV Saturation(S) value

（RGB colour /HSV Hue(H)/HSV Saturation(S) control for device y）

Output X ECG y —RGBW colour/White colour value

（RGBW colour/White colour control for device y）

Output X ECG y —Colour XY/Colour X/Colour Y value

（Colour XY/Colour X/Colour Y control for device y）

Output X ECG y — Relative HSV Hue(H)/HSV Saturation(S) value

(Relative HSV Hue(H)/HSV Saturation(S) control for device y)

Output X ECG y — Switch Status （request or respond to the switch status of device y）

Output X ECG y — Brightness Status （request or respond to the brightness status of device y）

Output X ECG y — Relative (percentage) colour temperature status（request or respond to the Relative (percentage) colour temperature status y ）

Output X ECG y — Absolute colour temperature status （request or respond to the Absolute colour temperature status of device y）

Output X ECG y — RGB colour /HSV Hue(H)/HSV Saturation(S) value status（request or respond to the RGB colour /HSV Hue(H)/HSV Saturation(S) value status of device y）

Output X ECG y —RGBW colour/White colour value status （request or respond to the RGBW colour/White colour value status of device y）

Output X ECG y —Colour XY/Colour X/Colour Y value status （request or respond to the Colour XY/Colour X/Colour Y value status of device y）

Output X ECG y — Relative HSV Hue(H)/HSV Saturation(S) value status(request or respond to the Relative HSV Hue(H)/HSV Saturation(S) value status of device y)

(X=output channel A, B; y=DALI device 1..64)

4.2.2 Group Control

The KNX-DALI-2 Gateway, 1/2-Fold is available in 16 groups, and multiple DALI devices for each output channel can be switching, dimming, brightness value, colour temperature, colour controlled by an object. First, activate the group function in the ETS parameter configuration, configure its parameters, and then use the DCA tool to group the DALI devices that need to be controlled together, an ECG can belong to different groups at the same time. The following communication objects can directly switching, dimming, brightness status, colour temperature, colour control:

Output X Group y — Switch （switch control for device y）

Output X Group y — Relative Dimming （relative dimming of all devices in group y）

Output X Group y — Brightness value （brightness value control for device y）

Output X Group y—Absolute colour temperature

（Absolute colour temperature control for device y）

Output X Group y— Relative (percentage) colour temperature

（Relative (percentage) colour temperature control for device y）

Output X ECG y — RGB colour /HSV Hue(H)/HSV Saturation(S) value

（RGB colour /HSV Hue(H)/HSV Saturation(S) control for device y）

Output X ECG y —RGBW colour/White colour value

（RGBW colour/White colour control for device y）

Output X ECG y —Colour XY/Colour X/Colour Y value

（Colour XY/Colour X/Colour Y control for device y）

Output X ECG y — Relative HSV Hue(H)/HSV Saturation(S) value

(Relative HSV Hue(H)/HSV Saturation(S) control for device y)

Output X Group y — Switch Status (request or respond to the switch status of the y group device)

Output X Group y — Brightness Status (request or respond to the brightness status of the y group

device)

Output X Group y—Absolute colour temperature

（request or respond to the Absolute colour temperature of the y group device）

Output X Group y — Relative (percentage) colour temperature status

（request or respond to the Relative (percentage) colour temperature status of the y group device）

Output X ECG y — RGB colour /HSV Hue(H)/HSV Saturation(S) value status

（request or respond to the RGB colour /HSV Hue(H)/HSV Saturation(S) value status of device y）

Output X ECG y —RGBW colour/White colour value status

（request or respond to the RGBW colour/White colour value status of device y）

Output X ECG y —Colour XY/Colour X/Colour Y value status

（request or respond to the Colour XY/Colour X/Colour Y value status of device y）

Output X ECG y — Relative HSV Hue(H)/HSV Saturation(S) value status

(request or respond to the Relative HSV Hue(H)/HSV Saturation(S) value status of device y)

(X=output channel A, B; y=group 1..16)

Note: Whether the group is configured via ETS or DCA tools , in order to make the ECG in the group control work normally, it is also necessary to activate the ECGs in the group via ETS, otherwise these ECGs configured in the group are invalid.

4.2.3 Scene Control

The scene control of the KNX-DALI-2 gateway, 1/2-Fold is divided into DALI scene、group scene and global scene. DALI scenes support recalling the internal scene settings of DALI drivers through DALI scene objects; Group scenes are used to control the target state of groups when receiving KNX scene controls; Global scenes can control custom ECG or group states through KNX scene numbers.

DALI scene: KNX-DALI-2 Gateway, 1/2-Fold provides an independent DALI scene control object for each output channel, allowing direct recall of the 16 standard scene controls in the corresponding DALI system through setting the object values. This functionality requires configuring the enabling of standard DALI scenes for different drivers and their corresponding states (including brightness, colour temperature, and colour) when executing scenes using the DCA tool. When a KNX device sends a DALI scene number to the DALI gateway, all ECGs configured with that scene will perform the operation to adjust the lamps to the preset state.

Group scene: KNX-DALI-2 Gateway, 1/2-Fold also provides 16 DALI group scene controls for each group, and the brightness, colour temperature, colour value of each group scene can be configured in the ETS. When the KNX device sends a scene number to recall a scene of a group in the DALI gateway, the gateway will send the group control command corresponding to the scene to the DALI bus.

Global scene: A global scene is configured via the DCA tool, in which the user can recall an ECG or group as an execution target and set the scene target state for them respectively. When the gateway receives a KNX scene control message sent on the bus, it recall the corresponding execution operation.

4.2.4 Broadcast Control

In the broadcast control mode, all DALI devices on the channel can simultaneously switching, dimming, brightness value, colour temperature, colour control. In the case of uneven brightness, the change of brightness is not synchronized, and some devices may reach the target brightness value first, some may reach the target brightness value later. When the database is not configured, clicking the test A/B button on the gateway can also switch all devices on the DALI bus in the channel.

4.2.5 Working Mode

Normal mode: Each DALI device and each DALI group in this mode can be used for switching, dimming, brightness value, colour temperature, colour control, as well as switching status and brightness status feedback.

Permanent mode: The DALI device or DALI group in this mode is output with a fixed brightness value. After the gateway is reset or programmed, the DALI device or group will automatically set the preset brightness value.

Note: If the DALI device fails (if the ECG is not powered when the gateway is started) and the device cannot output with the preset brightness value, the device brightness value will be automatically corrected within 60 seconds.In the permanent mode, you can still control the colour or colour temperature functions of the ECG.

Staircase mode: In this mode, the brightness values of the DALI device and the DALI group can be set by the switching, relative dimming and brightness values. The lamp brightness output is automatically turned off after a certain period of time delaying, or can be directly turned off by the object control. If the telegram of turning on the lamp is received again within the delay time before the lamp is turned off, the delay time is re-timed.

Normal/Night mode: The night mode control is similar to the staircase mode or the permanent mode. The main difference is that the night mode needs to be activated by activating the night mode object. If the night mode is not activated, the DALI device or the DALI group will work in the normal

mode. In night mode, the DALI device or DALI group lamps are automatically turned off after a certain period of time delaying, or output at a fixed brightness value.

Note:

1.Operation mode priority: In addition to the broadcast control, the burn-in mode has the highest priority, and if the ECG or group is in burn-in mode, it cannot be changed to any other mode. Followed by , permanent mode. Finally, normal, normal/night and staircase mode, they have the same priority.

2.When a DALI device is assigned to group control, it is not recommended for independent control. The main purpose is to avoid the conflict between the single device control mode and the group control mode.

3.The operation mode of the ECG has a lower priority than the group control operation mode. If the ECG is assigned to the group, its operation mode will be executed independently. However, once the ECG is assigned to a group, its operation mode will be determined by the group's operation mode. In cases where the ECG belongs to multiple groups, the operation mode of the ECG will be based on the group numbers, starting from the smallest to the largest.

4.2.6 Operation hour calculation

The gateway provides an operation time recording function for each lamp, unit in hours, as long as the brightness value is >0% and recorded, and the recorded operation time can also be reset by the object. It is recommended to configure a maximum for each ECG based on the life of the lamp and activate the alarm object to facilitate maintenance when comes to the life end of the lamp.

In order to learn about the life of the lamp, many lamps will undergo an burn-in test when first used. During the burn-in phase, the lamps cannot be turned off or dimmed, but run at 100% brightness. Therefore, the gateway is equipped with an burn-in function for each ECG and group, and each ECG or each group can activate the burn-in mode through the object. During burn-in, the ECG or group can no longer be controlled separately. If the gateway power off during burn-in, the burn-in mode does not continue when the power supply is restored. It needs to be restarted by the object. When the burn-in mode is normally stopped (if the aging time is completed or turned off by the object), the device will return to the on or off value, or the previous brightness value, depending on the parameter settings, and can be controlled separately.

4.2.7 ECG Failure or Lamp Failure Identification

A major advantage of DALI technology is the ability to individually identify lamp failures or ECG failures. Therefore, the gateway supports this function and offers a variety of analysis possibilities. In order to analysis, the gateway periodically scans all connected ECGs for ECG failures and lamp failures. The scan time can be configured via parameters. For example, if the time is set to 1s (standard setting) and 64 ECGs are connected, the complete process of scanning ECG and lamp failures takes 64s (each ECG and fault type is 1s), so it may be necessary to identify the failure before it has been occurred, it is probably about 1 minute. The failure scans of the two channels do not interfere with each other and can be performed simultaneously. The identified fault information can be sent to the KNX bus via the ECG's fault object (1 byte or 1 bit). In addition, the failure status of all ECGs can also be viewed via the debugging software tool, or the failure status of each ECG and lamp can be queried via object 14.

4.2.8 Device Failures Number and Failure Rate Analysis

On the entire DALI bus, according to the type of equipment failure, it is divided into ECG and lamp failure. The gateway sets the alarm settings for the fault rate for each type of failure, and can obtain their number of failures or failure rates through the communication objects, as well as the number of failures or failure rates in the entire DALI segment. In addition, the DCA tool can also be used to view the number of failures and failure rates for each fault type, as well as the total number of failures and the total failure rate (all ECGs and lamps).

4.2.9 colour Temperature Adjustment

The colour temperature determines the lamp colour of the lamp, and the colour temperature unit is Kelvin (K). The group control of this gateway supports colour temperature adjustment.

Known Kelvin values for lamp colours:

1500 K - candle

2700 K - incandescent lamp (60W)

2800 K - halogen lamp

4000 K - fluorescent lamp (natural white)

The table below lists common colour temperatures and describes the lamping atmosphere and the scenes that are commonly used.

colour temperature	colour	Atmosphere	Scenes
2700 K	Warm White	Comfortable and warm	Living room, bedroom
3000 K	Bright and warm white	Warm, slightly brighter than warm white	Living space, restaurant
3500 K	Natural white	Objective and friendly	Corridor, office, showroom
4000 K	Natural white	Bright	Bathroom, kitchen, basement, garage
5300 K above	Daylight white	Similar to daylight, the blue ratio is very high	Industrial area, classroom

Note: When selecting lamps that support DALI signal conditioning and colour temperature adjustment, pay attention to the type of lamps. There are two types of DT6 and DT8 commonly used on the market, and their control methods are different. DT6 needs to occupy two DALI addresses, while DT8 occupies one DALI address. If two DALI addresses is used to control a lamp, the number of lamps that can be controlled on the DALI bus will be reduced by half. For DT8, it currently supports colour temperature adjustment. (DT6 occupies a DALI address when no colour temperature adjustment)

4.3 Operation Steps

The following steps are required for a newly installed project or a rectified project:

1.Trigger broadcast switch control by short-pressing the Test/Set button to test if any DALI devices are not connected properly.

2.Parameter configuration of the device through the ETS software, and download the configured parameters to the gateway.

Note： The device type set for the ECG in ETS must match the actual driver type being used; otherwise, some functions may not be controllable.

3.Use the DCA tool to read the device status. Click the "Sync.DaliBus" operation button to read the device status.

If the number of devices, parameters, and their configurations are correct, the DALI bus initialization is not performed. If it is not correct, the device on the DALI bus needs to be initialized. There are 2 ways to initialize an operation:

①Press and hold the Test/Set button for more than five seconds. The DALI gateway starts to initialize the device on the bus and assigns an address to the DALI device from 0 to 64.

②Click on the operation button “[All]init DALI device” on the DCA tool.

4.If the device type set by ECG in ETS is not consistent with the actual driver type, you can modify the correspondence between ECG and the driver address by using DCA tool, dragging the device pane or left double-clicking to enter the device detail page to modify.

5.Using the DCA tool to modify partial parameter configurations, such as scene allocation, group allocation, etc.

6.Deploying all configurations to the device.

If you do not follow the above steps, the DALI device may not perform the operation according to the preset brightness value.

Note: In the address allocation phase, if there is an incomplete allocation address, start the initialization without address allocation operation (by DCA tool). If address allocation still fail more than twice, then you need to start the DALI bus initialization operation (by DCA tool or long press the Test/set button on the device for more than 5 seconds), this operation may cause the DALI device addressed to occur change, you need to check the correspondence between the ECG and the driver address after configuration to ensure that the device type set by the ECG needs to be the same as the type of the actual driver, otherwise some of the functions will not be controlled.

Chapter 5 Parameter Setting Description in the ETS

5.1 KNX Secure

KNX-DALI-2 Gateway, 1/2-Fold is a KNX device that complies with the KNX secure standard. That is, you can run the device in safe way.

Fig.5.1 (1) "KNX Secure" parameter window

The device with KNX secure will be displayed notes on ETS, as shown as Fig.5.1(1).

If secure commissioning is actived in ETS project, the following information must be considered during device debugging:

❖ It is essential to assign a project password as soon as a KNX Secure device is imported into a project. This will protect the project against unauthorized access.

The password must be kept in a safe place – access to the project is not possible without it (not even the KNX Association or device manufacturer will be able to access it)!

Without the project password, the commissioning key will not be able to be imported.

❖ A commissioning key is required when commissioning a KNX Secure device (first download). This key (FDSK = Factory Default Setup Key) is included on a sticker on the side of the device, and it must be imported into the ETS prior to the first download:

✧ On the first download of the device, a window pops up in the ETS to prompt the user to enter the key, as shown in Fig.5.1 (2) below.

The certificate can also be read from the device using a QR scanner (recommended).

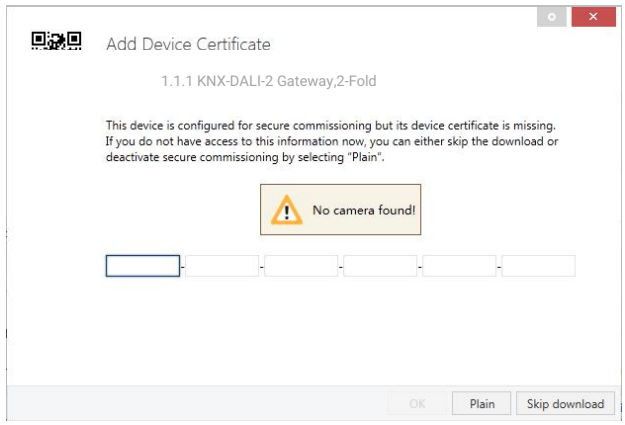


Fig.5.1(2) Add Device Certificate window

✧ Alternatively, the certificates of all Secure devices can be entered in the ETS beforehand.

This is done on the "Security" tab on the project overview page, as shown in Fig.5.1(3) below.

The certificates can be also added to the selected device in the project, as shown in Fig.5.1(4).

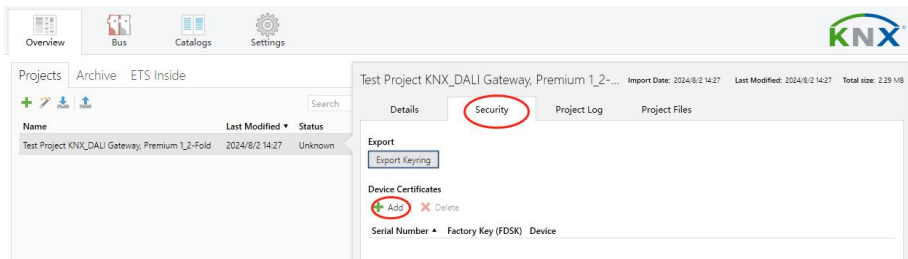


Fig.5.1(3) Add Device Certificate

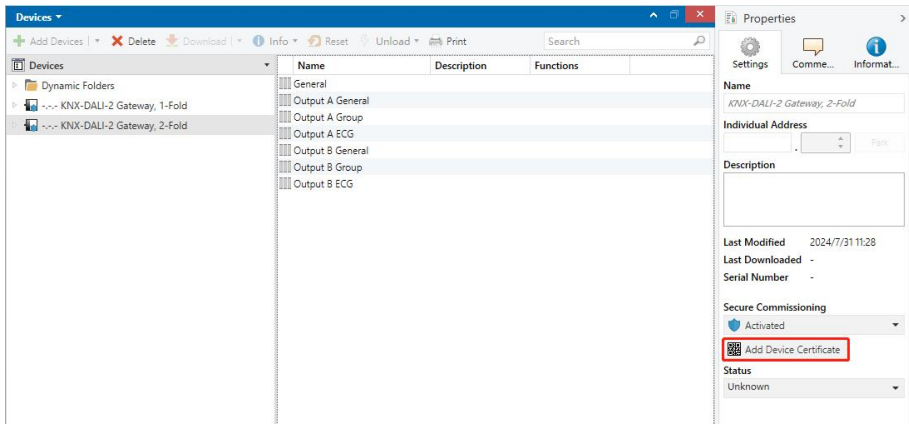


Fig.5.1(4) Add Device Certificate

✧ There is a FDSK sticker on the device, which is used for viewing FDSK number.

Without the FDSK, it will no longer be possible to operate the device in KNX Secure mode after a reset.

The FDSK is required only for initial commissioning. After entering the initial FDSK, the ETS will assign a new key, as shown in Fig.5.1(5) below.

The FDSK will be required again only if the device was reset to its factory settings (e.g. If the device is to be used in a different ETS project).

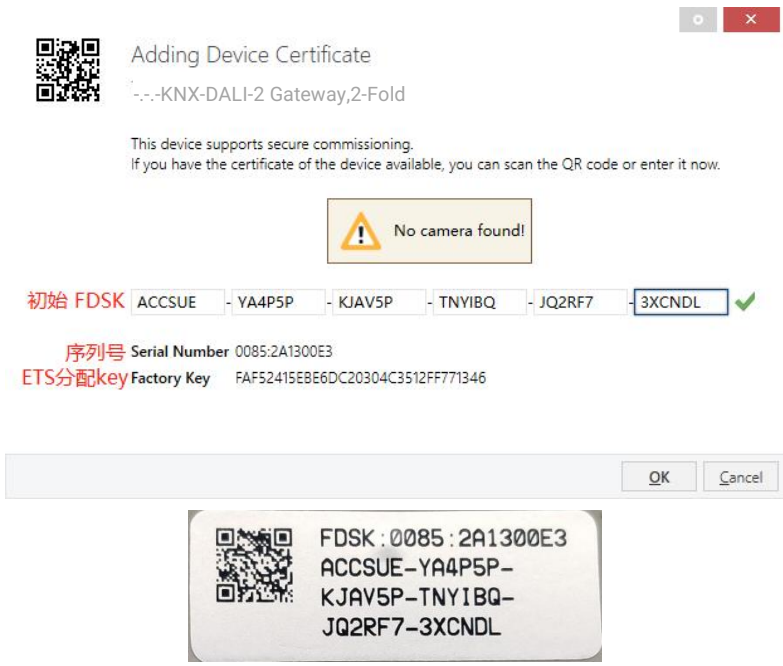


Fig.5.1(5)

Example:

If this application in the project needs to be tried with another device, it is no longer the original device. When the application is downloaded to a new device, the following prompt will appear on the left of Fig.5.1(6), click yes, the Add Device Certificate window will appear, then enter the initial FDSK of the new device, and you need to reset the device to the factory settings (it is not required if the device is still factory default; If it has been used, it will be required to reset, otherwise the following error message will appear on the right of Fig.5.1(6)), and then the device can be successfully downloaded again.

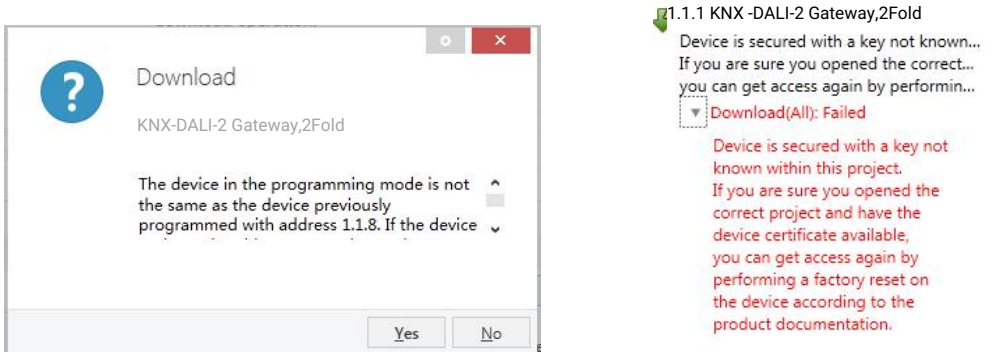


Fig.5.1(6) Example

Whether the device is replaced in the same project, or the device is replaced in a different project, the processing is similar: **Reset the device to the factory settings, then reassign the FDSK.**

After the device is downloaded successfully, the label Add Device Certificate turns gray, indicating that the key for this device has been assigned successfully, as shown in Fig.5.1(7) below.

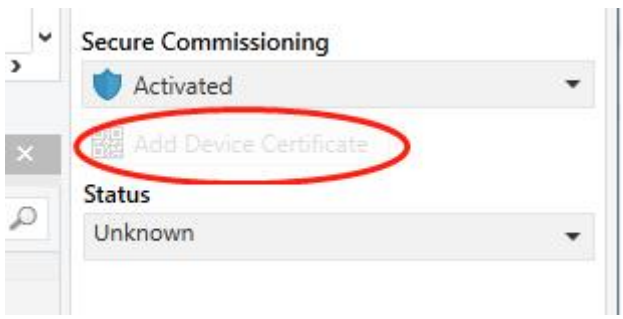


Fig.5.1(7)

ETS generates and manages keys:

Keys and passwords can be exported as needed to the use of security keys outside of the associated ETS projects. As shown in Fig.5.1(8) below, the file extension is .knxkeys.

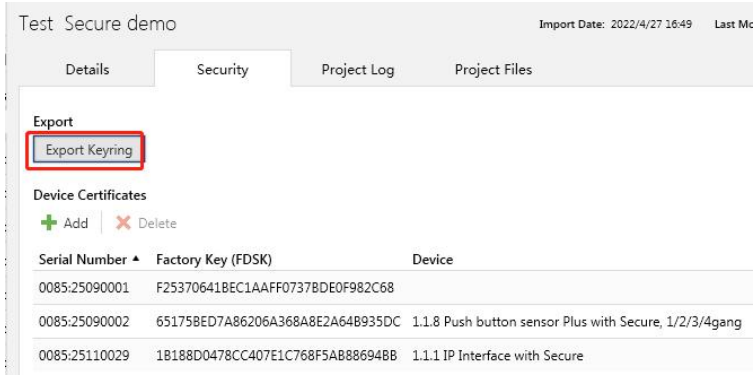


Fig.5.1(8)

Note: Any USB interface used for programming a KNX Secure device must support "long frames". Otherwise ETS will report a download failure information, as shown below.

5.2 Parameter window“General”

Parameter setting interface "General" as shown in Figure 5.2, the configured basic parameters are valid for all DALI devices of the gateway.

The parameter configuration and functions are the same whether it is 1-Fold or 2-Fold. The following section will take 2-Fold as an example.

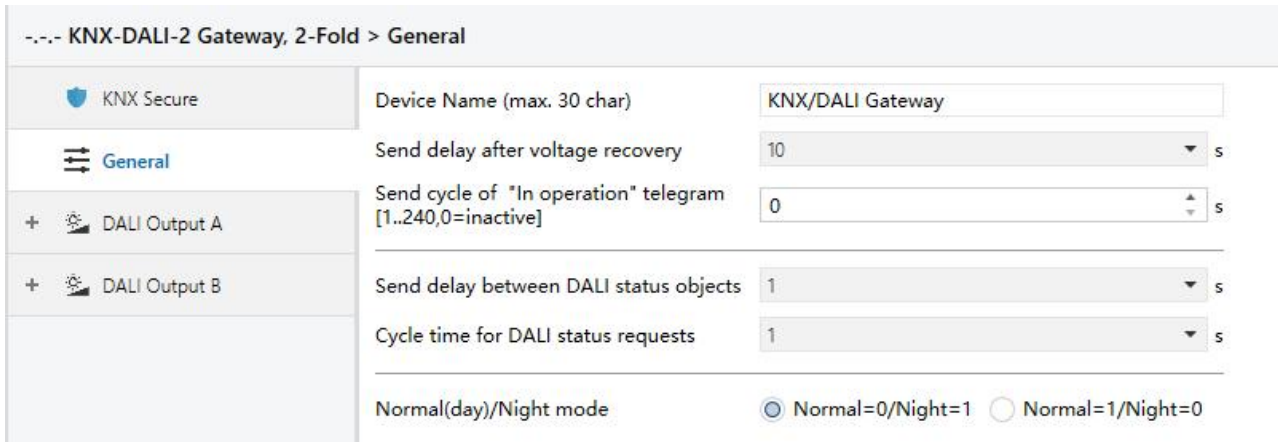


Fig.5.2 Parameter window“General”

Parameter “Device Name(max.30 char)”

This parameter is used to input the device name (up to 30 characters).

Parameter “Send delay after KNX bus recovery”

This parameter defines the time delay for sending status telegrams after the bus recovery reset. Only when the delay completed can the device send status telegrams to the bus. In a project with multiple gateways installed, different settings for this parameter can prevent all devices from sending status telegrams at the same time. Options:

Immediately

5s

10s

...

60s

This delay time does not include the initialization time of the device. This delay begins when the device is initialized.

After the bus voltage is recovery, the initialization time of the device startup increases with the increase of the connected DALI device. When the device is connected to 128 ECGs, the device startup initialization time will be completed within 2 minutes (excluding initialization time of KNX DALI gateway).

Note: This parameter only affects the status telegrams sent to the bus, and does not affect the operation performed. The operation is completed and may be performed after the device is initialized.

Parameter "Send cycle 'In operation' telegram (1..240, 0=inactive)"

This parameter sets the interval at which the device periodically sends a telegram through the bus to indicate that the device application layer is operating normally. When set to "0", the object "In operation" will not send a telegram. If the setting is not "0", the object "In operation" will send a telegram with logic "1" to the bus for the set time period. Options: **0...240s, 0=inactive**

The cyclic telegram is monitored by the external device. If the external device does not receive the telegram within the monitoring time, the device is considered to be faulty or the bus transmission is interrupted. In order to reduce the bus load as much as possible, the maximum time interval should be selected according to actual needs.

Note: The time interval is counted from the completion of the device initialization, regardless of the bus power-on delay transmission.

Parameter "Send delay between DALI status objects"

This parameter defines the delay between sending DALI status telegrams, that is, the interval between each status telegram transmission, which can prevent excessive bus load, for example, broadcast switch control. Options:

No delay

0.5s

1s

2s

...

10s

All status telegrams sent to the bus are affected by this parameter setting, such as switch status, brightness status, DALI failure status, and so on.

Parameter "Cycle time for DALI status requests"

This parameter sets the time period for sending DALI device (brightness, failure) request. In order to analyze ECG and lamp failures, and to figure out the actual brightness status of the lamp, failure request telegram and brightness query telegram must be sent periodically to the ECG on the DALI bus. Options:

No request

0.5s

1s

2s

...

10s

For example, if it is set to 1s and 64 ECGs are connected, the complete process of scanning the ECG and the lamp takes 64s (each ECG and failure type is 1s), so it may take about 1 minute before identifying that a failure has occurred.

This setting mainly affects the DALI bus, where a longer cycle can reduce the bus load. However, it may not be possible to immediately detect faults on DALI devices. Similarly, detecting new devices or recovering devices also takes longer.

Note: If "No request" is set, the gateway will not recognize the ECG and lamp failure or actual working status, so it is recommended to select this option in special cases, and for this option, there will be no status feedback when recalling group/global scenes.

Parameter "Normal(day)/Night mode"

This parameter for setting object value of normal/night mode. Options:

Normal=0/Night=1

Normal=1/Night=0

Note：This function is associated with driving the opening brightness value. Different brightness values can be set for normal and night. It affects the execution of the ECG's night control mode. If it is a normal gateway, the ECG/group's night control mode will not be executed.

5.3 Parameter window“DALI Output A/B”

This interface mainly sets the general parameters of the DALI device in the channel, such as KNX bus failure or reset action, status transmission mode, failure report and failure analysis. The parameters of the two channels are the same as the objects. The following is an example of one of the channels.

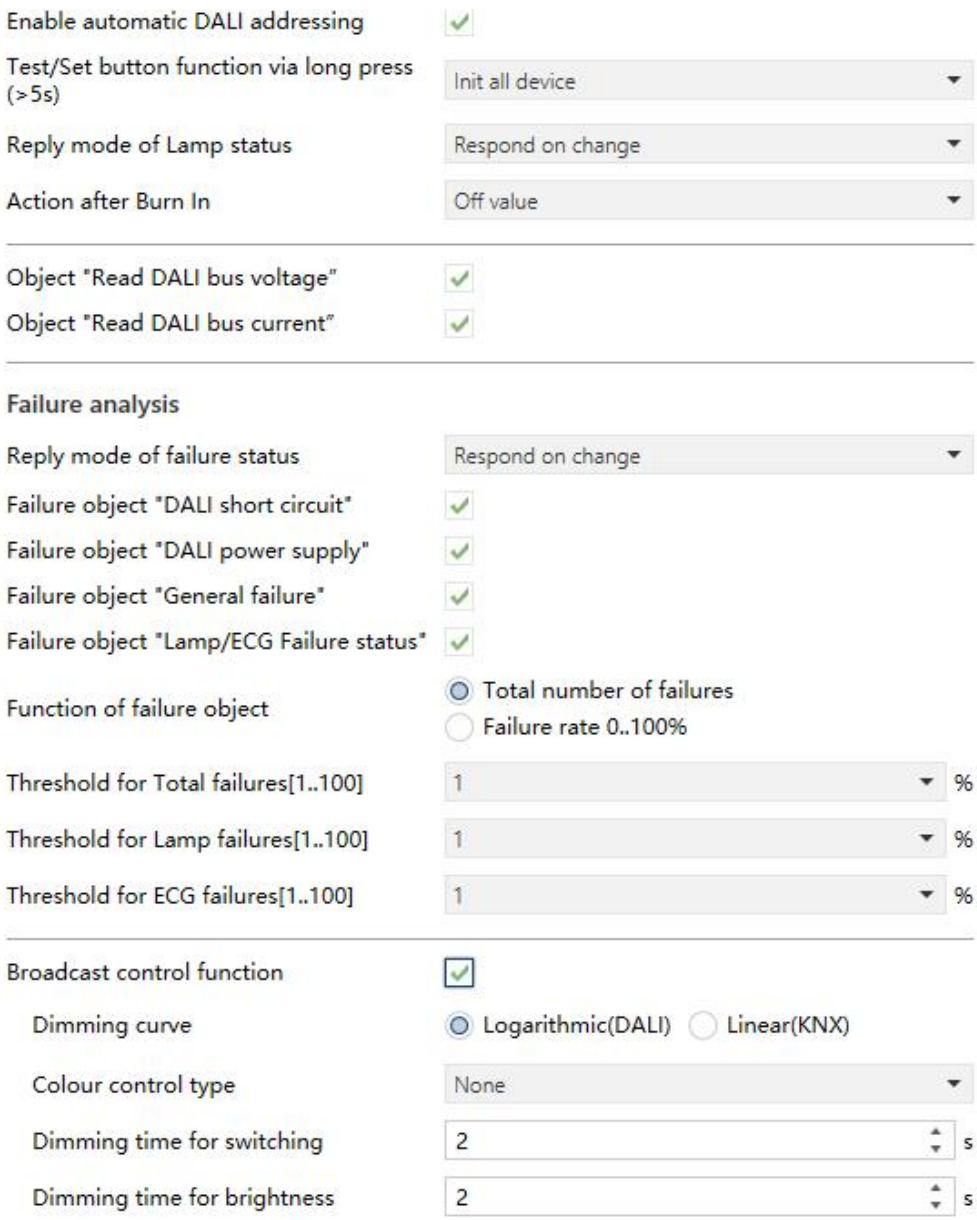


Fig.5.3 Parameter window“DALI Output A/B”

Parameter "Enable automatic DALI addressing"

This parameter sets whether a DALI device without a DALI address is automatically initialized after the gateway supply voltage recovery or reset, that is, whether the gateway automatically assigns the first free DALI address to it.

Disable：The gateway does not assign DALI addresses on gateway supply voltage recovery. If a DALI device without an address has been installed, the gateway can only control it using a broadcast telegram. If a DALI device with an existing address has been installed, the gateway will not change it. **(The DALI address can still be assigned via the commissioning software tool or the Test/Set button on the front of the gateway)**

Enable：If the gateway locates a DALI device without a DALI address on supply voltage recovery, the gateway automatically allocates it the first free DALI address.

It is advantage that DALI addressing without gaps makes it possible to replace a defective DALI device without additional addressing or commissioning. All that is required is to connect a DALI device without address. The gateway addresses the new device with the first free DALI address of the removed failed device, and transfers its properties to the new device.

Parameter "Test/Set button function via long press(>5s)"

The parameter sets the function of the Test/Set button, and it need be performed via a long operation that press the button longer than 5s. Options:

No action

Init no address device

Init all device

No action：It is no action.

Init no address device：The gateway can initialize the DALI devices without a DALI address on the DALI bus via long press the button >5s.

Init all device： The gateway can reinitialize all DALI devices on the DALI bus via long press the button >5s.

Parameter "Reply mode of Lamp status"

This parameter defines the feedback conditions of lamp status when under the group and ECG control, that is, the feedback conditions for the switch status and brightness status. Options:

Respond after read only

Respond after change

Respond after change and bus reset

Respond after read only：Only when the device receives a request from another bus device or bus to read the switch status or brightness status of the group or ECG, does the status object send the current switch or brightness status to the bus.

Respond after change： When the switch status or brightness status changes, the status object sends a telegram to the bus to report the current status.

Respond after change and bus reset： When the switch status, brightness status changes or bus reset, the status object sends a telegram to the bus to report the current status.

Note: The switch status and brightness status of the group can only be feedback locally, and the status of each lamp cannot be accurately fed back. Therefore, it is recommended to use ECG status feedback.

Parameter "Action after Burn In"

This parameter defines the brightness value of the ECG/lamp after burnt in. Options:

On value

Off value

Last brightness value

On value：Outputs the brightness value of "Switch on".

Off value：The outputs are off.

Last brightness value：The brightness value of the ECG/lamp will be saved before burnt in. After the burn in is completed, the ECG/lamp returns to the previous brightness value.

Parameter "Object "Read DALI bus voltage" "

This parameter sets whether to enable the object for reading the DALI bus voltage, responding only to the DALI bus voltage status when read.

Parameter "Object "Read DALI bus current" "

This parameter sets whether to enable the object for reading the DALI bus current, responding only to the DALI bus current status when read.

Faulure analysis

Parameter "Reply mode of failure status"

This parameter defines the conditions for sending ECG and lamp failure conditions. Options:

Respond after read only

Respond after change

Respond after change and bus reset

Respond after read only: Only when the device receives a request to read the fault status from another bus device or ECG/Group, the status object send the current failure status to the bus.

Respond after change: When the failure status changes, the status object sends a telegram to the bus to report the current status.

Respond after change and bus reset: When the failure status changes or bus reset, the status object sends a telegram to the bus to report the current status.

Parameter "Failure object "DALI short circuit""

This parameter is used to report whether a short circuit is present on the connected DALI bus.

Parameter "Failure object "DALI power supply""

This parameter is used to report whether there is an failure in the power supply of the DALI bus.

Parameter "Failure oviect "General failure""

This parameter is used to report faults on the DALI bus channel. In case of any type of fault occurrence, the object will send a telegram "1" on the bus, and send "0" when the fault is cleared. For example, ECG, lamp faults.

Parameter "Failure object "Lamp/ECG Failure status""

This parameter sets whether the object for the channel ECG/lamp failure centrally send status is enabled. Options:

Disable

Enable

Enable: The object "Lamp/ECG Failure status" is visible and is used to send the lamp or ECG failure status. The 1 byte object value is defined as follows:

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
ECG failure	Lamp failure	ECG number1..64					

example:

1. 1000 0011 (object value 131) indicates ECG failure of ECG4.

0100 0010 (object value 66) indicates lamp failure of ECG3.

This object can also be used to query the lamp and ECG failure. When the highest two bit value, both Bit7 and Bit6, of the telegram received by the object are 1, indicating to query the ECG x failure, such as:

Query the failure status of ECG3: 1100 0010 (object value 194)

If the ECG of ECG3 is faulty, the gateway will respond: 1000 0010 (object value 130)

Lamp failure: One or more fixtures does not working (damaged) or are not connected.

ECG failure: One or more ballasts on the output of the DALI gateway do not work or are not

connected.

Parameter "Function of failure object"

This parameter sets the transmission mode of the lamp and ECG failure, whether to send by the ratio of the faulty device or the number of faulty devices. In different ways, the data types of the failure objects 7, 9, and 11 are also different. Options:

Total number of failures

Failure rate 0..100%

Total number of failures: The number of faulty devices sent directly by the object to the bus.

Failure rate 0..100%: The failure rate of the faulty device in the total number of devices that is sent to the bus by the objects.

For example, if there are 8 lamps and 1 failure, then the lamp failure rate is 12%.

Parameter "Threshold for Total failures[1...100]"

This parameter is used to configure the alarm threshold for all (ECG and lamp) failures (object 8) in the channel. The threshold relates to the failure of all ECGs and lamps at the DALI end of the channel, and when the total number of failures exceeds the set threshold, the object 8 sends an alarm. Options: **1..100%**

Parameter "Threshold for Lamp failures[1...100]"

This parameter is used to configure the alarm threshold for all lamp failures (object 10) of the channel. The threshold relates to the failure of all the lamps at the DALI end of the channel, and when the total number of failures exceeds the set threshold, the object 10 sends an alarm. Options: **1..100%**

Parameter "Threshold for ECG failures[1...100]"

This parameter is used to configure the alarm threshold for all ECG failures (object 12) of the channel. The threshold relates to the failure of all ECGs at the DALI end of the channel, and when the total number of failures exceeds the set threshold, the object 12 sends an alarm. Options: **1..100%**

Parameter "Broadcast control function"

This parameter is used to set whether to enable the broadcast control function.

Broadcast control applies to all devices on that channel, allowing them to receive DALI broadcast control even if they are not individually addressed.

When the broadcast control function is enabled, the following parameters are visible:

--Parameter "Dimming curve "

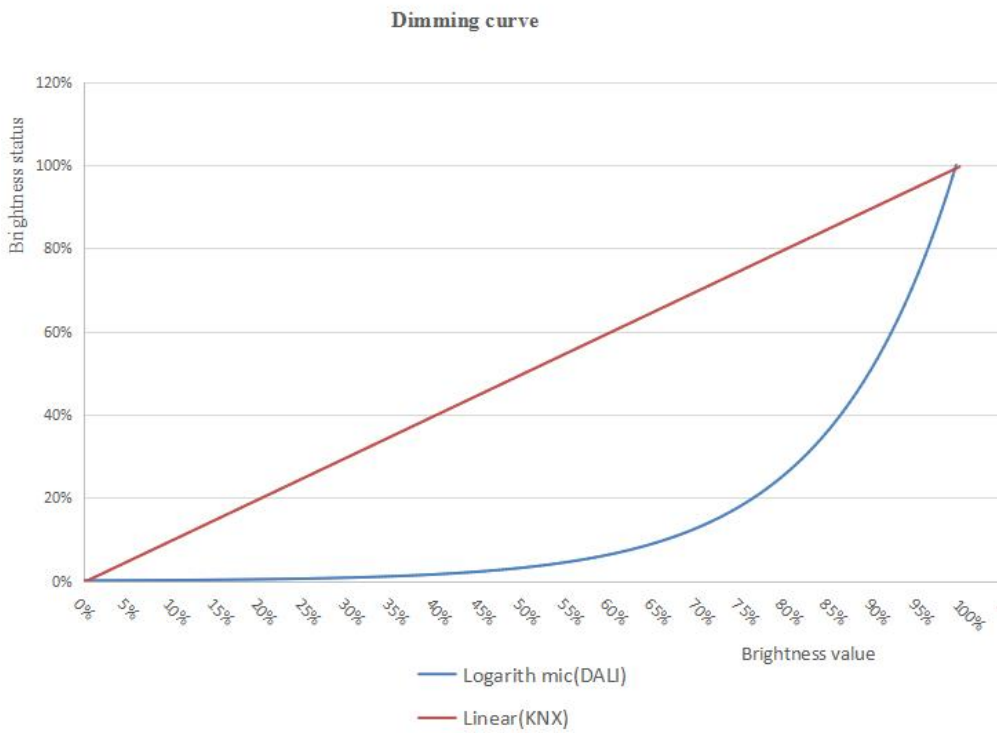
This parameter sets the dimming curve for the Broadcast control. Options:

Logarithmic(DALI)

Linear(KNX)

In the KNX to DALI, by default, all lamps use a logarithmic dimming curve. However, this product also provides a linear dimming curve, achieved through the gateway's own fitting adjustment process to produce a linear dimming effect.

The logarithmic(DALI) and linear (KNX) dimming curves as shown in the following figure:



In the KNX to DALI, the ballast curve is set by default to a logarithmic dimming curve. Unless necessary, please do not modify the dimming curve, as changing the dimming curve settings may cause issues with the aforementioned dimming curve settings.

--Parameter "Colour control type"

This parameter is used to set the type of broadcast colour control. Only devices that support this control type will respond. Options:

None

Colour Temperature

RGB Colour

RGBW Colour

XY Colour

Colour Temperature: Cool-warm colour control.

RGB Colour: Three RGB colour controls.

RGBW Colour: Four RGBW colour controls.

XY Colour: It is a method of controlling colour in colour space through two specified coordinates.

--Parameter "Object type for RGB Colour"

This parameter is visible when "RGB Colour" is selected, used to set the object type for RGB colour control. Options:

RGB(Combined object)

HSV(Separated objects)

H, S, V represent the hue, saturation, brightness (brightness value adjustment) respectively

--Parameter "Object type for RGBW Colour"

This parameter is visible when "RGBW Colour" is selected, used to set the object type for RGBW colour control. Options:

RGBW(Combined object)

HSVW(Separated objects)

--Parameter "Object type for XY Colour"

This parameter is visible when "XY Colour" is selected, used to set the object type for XY colour control. Options:

XY(Combined object)

XY(Separated objects)

Note: When broadcast control switch is turned on, the device's colour values remain as they are. Broadcast control "switch on" defaults to 100% brightness when turned on and 0% when turned off.

When the connected ECG is in a special mode, such as aging mode, the ECG cannot be controlled through broadcast "switch" and "brightness value" objects, but the colour can be adjusted.

--Parameter "Dimming time for switching"

This parameter is used to define the dimming time for switch status changes during broadcasting. Options: **0...255s**

--Parameter "Dimming time for brightness"

This parameter is used to define the total dimming time for brightness during broadcast control.

Options: **0...255s**

--Parameter "Dimming time via set colour value"

This parameter is visible when "None" is no selected, used to define the total dimming time for colour during broadcast control.Options: **0...255s**

5.4 Parameter window"ECG/Group Template setting"

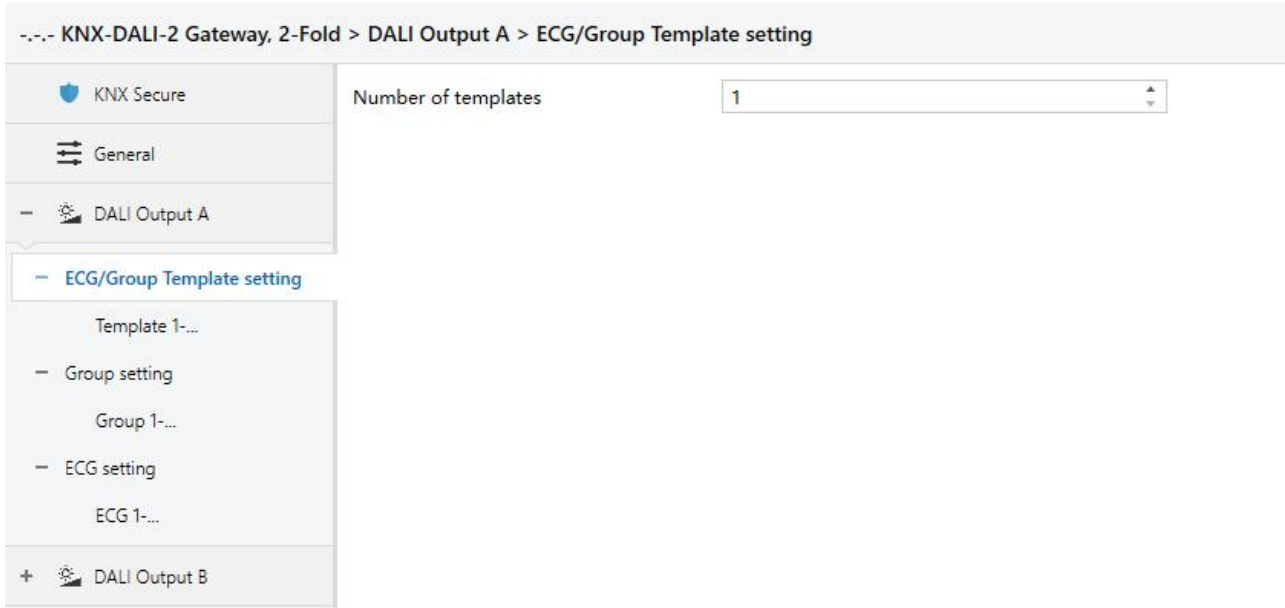


Fig.5.4 Parameter window"ECG/Group Template setting"

Parameter "Number of templates"

This parameter is used to set the number of parameter setting templates for ECG and group operations, up to 8.

5.4.1 Parameter window“Template X(X=1~8)”

Parameter setting interface “Template X is shown in Figure 5.4.1. Here, the group control and ECG control action behaviors are set. A total of 8 parameter setting templates are provided. If the action of the group control and ECG control is as configuration of ECG,then the action behaviors will be configures by the DCA tool.

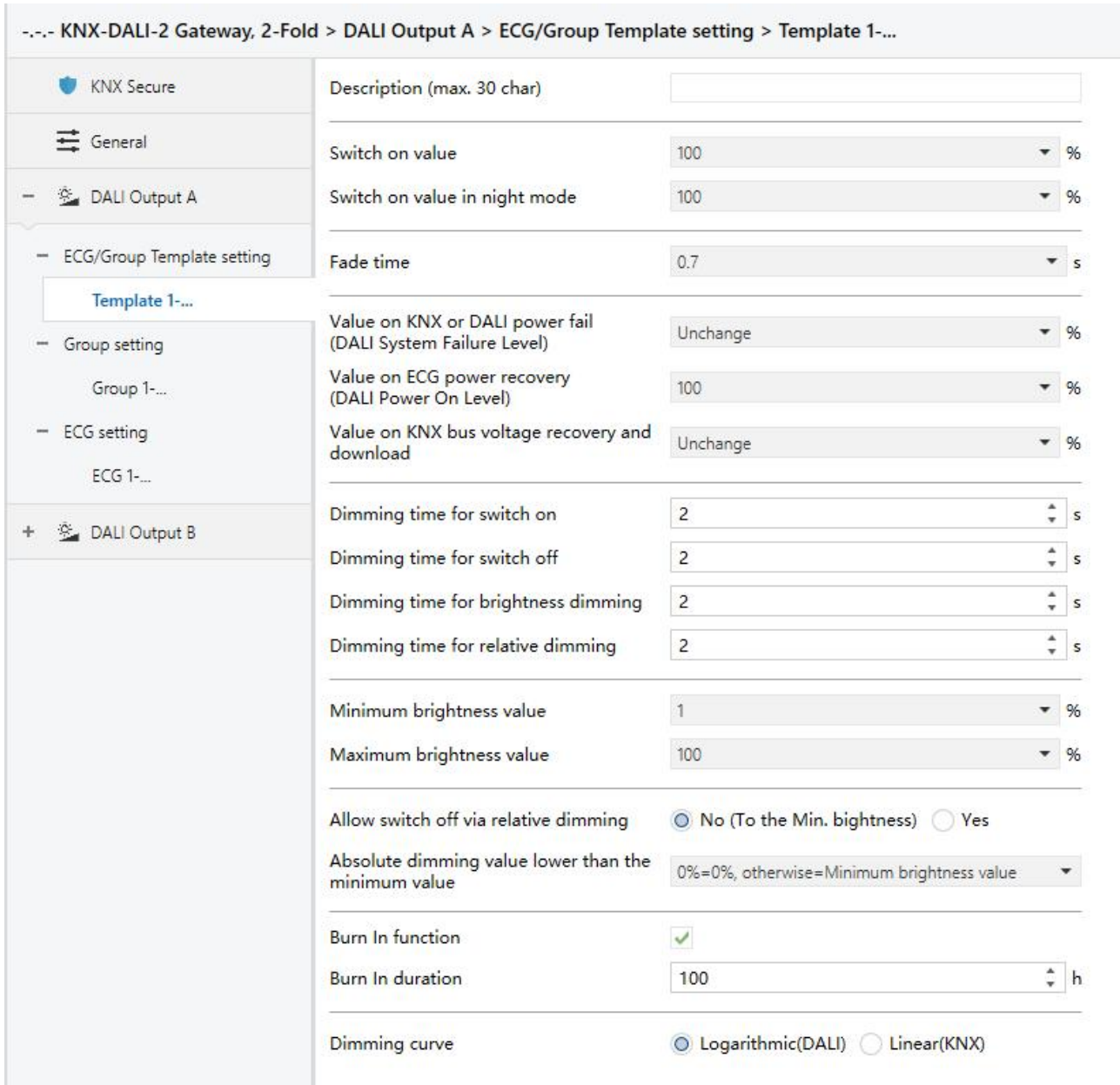


Fig.5.4.1 Parameter window“Template X”(X=1~8)

Take one of the templates as an example to illustrate the parameter settings:

Parameter "Description (max.30 char)"

This parameter is used to input the parameter setting templates name (up to 30 characters).

Parameter "Switch on value"

This parameter defines the brightness value of "Switch on". Options:

1%

5%

...

100%

Last brightness value

Last brightness value: The value of the brightness before the lamp is turned off. Defaults to 50% when uncertain.

For ECG/Group, if there is a distinction between normal/night, this parameter sets the switching value for normal. Without differentiation, the switching value of this parameter is used regardless of normal/night.

Parameter "Switch on value in night mode"

This parameter defines the brightness value of "Switch on" in night mode. Options:

Disable

1%

5%

...

100%

Last brightness value

Disable: The brightness value is not differentiated between normal and night, so the brightness value used for switch on the lamps at night remains the same as during the normal.

Last brightness value: The value of the brightness before the lamp is turned off. Defaults to 10% when not sure.

Parameter "Fade time"

This parameter sets the fade time of the DALI driver adjust brightness, colour temperature and colour .

Options:

0s

0.7s

1.0s

1.4s

2.0s

...

90.5s

Parameter "Value on DALI power fail (DALI System Failure Level)"

This parameter defines the brightness value of the lamp after the DALI bus is powered off. This value is saved in ECG, and ECG automatically changes the output of the brightness value in the event of power off. Options:

0%

1%

5%

...

100%

Unchange

Unchange: The output brightness value is the brightness value before DALI bus power off, that is, the lamp brightness does not change.

Parameter "Value on ECG power recovery (DALI Power On Level)"

This parameter defines the brightness value of the lamp after ECG power-on reset. This value will be saved on the ECG, and the ECG will output the brightness value when the ECG is powered on and reset. Options:

0%

1%

5%

...

100%

Value before failure

Value before failure：The output brightness value is the brightness value before the ECG is power recovery.

Parameter "Value on KNX bus voltage recovery and download "

This parameter defines the brightness value of the KNX bus voltage recovery and download.

Options:

0%

1%

5%

...

100%

Unchange

Value before failure

Unchange: The brightness does not change and remains current.

Value before failure: The brightness returns to the state before KNX bus voltage failure. To ensure that the brightness is restored after the KNX bus voltage recovers, the brightness value must be set for at least two seconds before the KNX voltage failure or download (otherwise, there may be fail to

saving). Regarding the download, it refers to the brightness value before the download.

Parameter "Dimming time for switch on/off"

This parameter defines the dimming time of the lamp brightness. That is, the dimming time of the brightness from 0% to 100% or 100% to 0%. Options: **0...255s**

Parameter "Dimming time for brightness dimming"

This parameter defines the dimming time for brightness dimming. Options: **0...255s**

Parameter "Dimming time for brightness/relative dimming"

This parameter defines the dimming time for brightness/relative dimming. Options: **1...255s**

Parameter "Minimum brightness value"

This parameter defines the minimum control brightness value of the lamp, which refers to the minimum brightness value controllable by the KNX-DALI-2 Gateway for lamps. Options:

0%

1%

2%

...

49%

Parameter "Maximum brightness value"

This parameter defines the maximum control brightness value of the lamp, which refers to the maximum brightness value controllable by the KNX-DALI-2 Gateway for lamps. Options:

50%

51%

...

100%

Note: Any control command with brightness is limited to the minimum and maximum brightness value output.

Parameter "Allow switch off via relative dimming"

This parameter defines whether to allow the lamp to be switched off by relative dimming .Options:

No（To the Min.brightness）

Yes

No（To the Min.brightness）: No allow, only dim down to minimum brightness.

Yes: When the brightness is dim down to the minimum brightness value, the lamp is turned off directly.

Parameter "Absolute dimming value lower than the minimum value"

This parameter sets the behavior when the absolute dimming value lower than the minimum value. Options:

0%=0%, otherwise=Minimum brightness value

To be the minimum brightness value

To be 0%

0%=0%, otherwise=Minimum brightness value: Output at the minimum brightness value. if it is 0%, the lamp is turned off.

To be the minimum brightness value: Output at the minimum value, even if it is 0%.

To be 0%: Turn off the lamp.

Parameter "Burn In function"

This parameter sets whether the burn in function is enabled. During burn in, the lamp burn in maximum brightness, and the ECG/group can no longer be controlled separately. If the gateway power off during burn in, the burn in mode will not continue when power recovery; it needs to be restarted through an object. When the burn in mode is stopped normally (such as when the burn in time is completed or turned off through an object), the device will switch on/off, or return to the previous brightness level, depending on the parameter settings, and can be controlled separately again.

Note：In burn in mode, the colour can be adjusted, triggered or exited through the burn in object of channel A/B.

--Parameter "Burn In duration"

After the burn in function is enabled, this parameter is visible and is used to set the duration of the burn in phase of the DALI device. Options: **1...255h**

Parameter "Dimming curve "

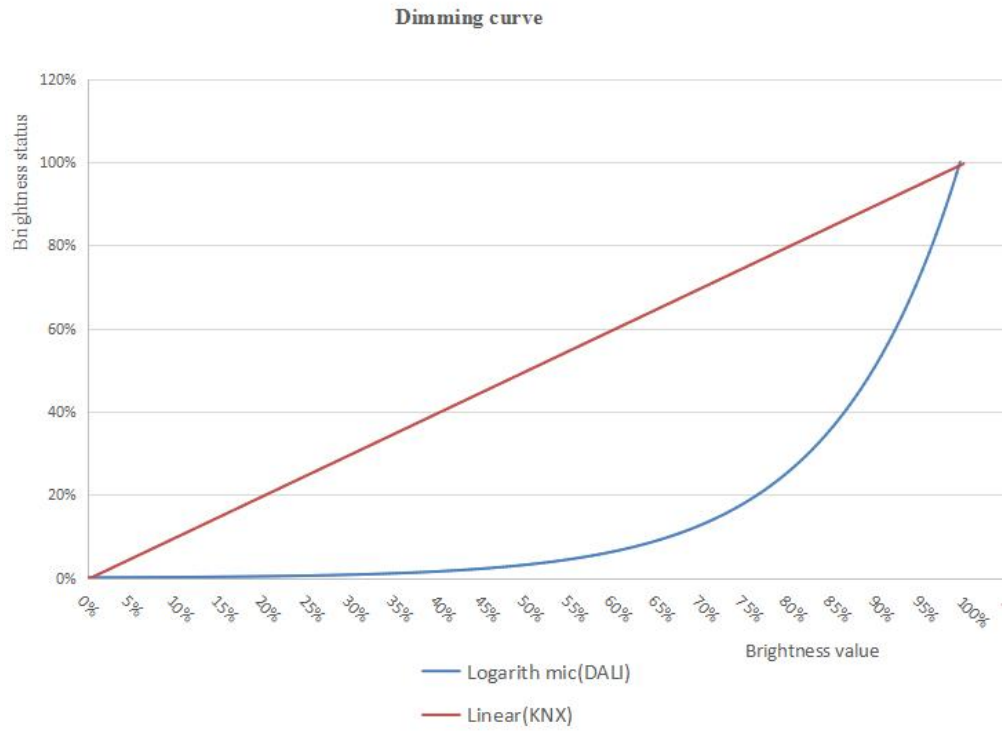
This parameter sets the dimming curve type that the DALI device operates on when this template is selected. Options:

Logarithmic(DALI)

Linear(KNX)

For example, if the current driver curve type is a logarithmic dimming curve, if logarithmic is selected, fitting will not to fitting.If linear dimming curve is selected here, the adjustment effect will be simulated as linear through fitting.

Similar to the dimming curves under broadcast control and will not be repeated here.



5.5 Parameter window“Group setting”

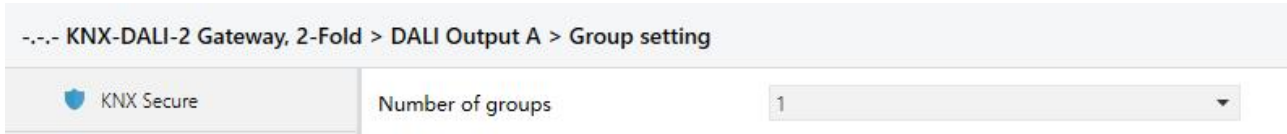


Fig.5.5 Parameter window“Group setting”

Parameter “Number of groups”

This parameter is used to set the number of group, up to 8.

None

1

2

...

16

5.5.1 Parameter window"Group X"(X=1~16)

Parameter setting interface"X: Group" is shown in Figure5.5.1. Here is to setting the group control of the DALI device.

Each channel of KNX/DALI gateway provides 16 groups. We can group multiple DALI devices that we want to control together by DCA tools. Then the devices in this group can be switched, dimmed or set the brightness value at the same time. If the properties of the devices in the same group are different, the dimming effects of the DALI devices will be different.

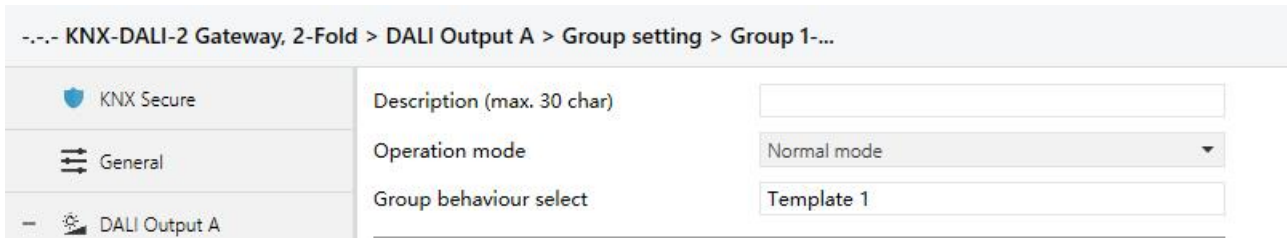


Fig.5.5.1 Parameter window"Group X"

Parameter "Group description(max 30 char.)"

This parameter is used to describe the group and allows up to 30 characters to be entered.

Parameter "Operation mode"

This parameter sets the operating mode of the group. Options:

Normal mode

Permanent mode

Normal/Night mode

Staircase mode

Normal mode: Common switch control of the lamp, such as switching, dimming and setting the brightness value of the DALI device in the group.

Permanent mode: The DALI device in the group outputs with a fixed brightness value, the brightness cannot be switched or changed.

Note：No dimming time from permanent mode

Normal/Night mode: Under the normal mode, the control is the same as the first option. After switching to night mode, the lamp can be turned off in a delay time after the lamp is turned on, or output with a fixed brightness value. Activate night mode via object 2.

Note：This function is associated with Object 2 "Normal(day)/Night mode" , and will only execute the corresponding configuration in night mode.

Staircase mode: Turn on the Staircase lighting and automatic turn off after delay time.

Parameter "Group behaviour select"

This parameter sets the behavior of the group, which is achieved by recalling the settings of the template. Options:

Template 1

...

Template 8

5.5.1.1 Operation mode “Normal mode”

This section only describes the parameter settings under the normal mode.

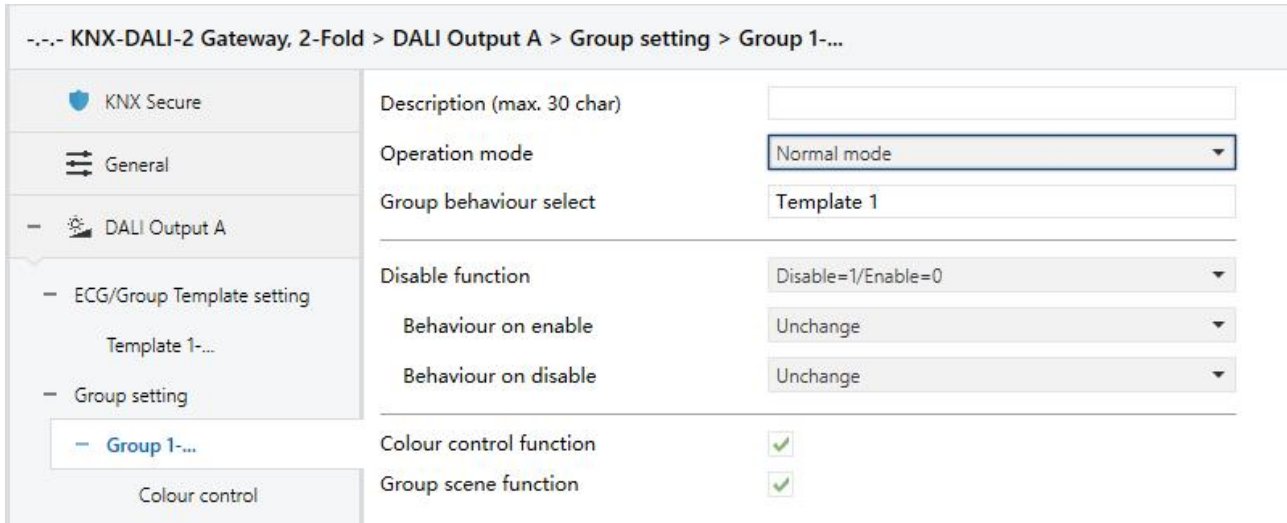


Fig.5.5.1.1 “Normal mode”

This same parameter will not be illustrated in next chapters, the usage is similar.

Parameter “Disable function”

This parameter sets the disable/enable control for the group. This function is not supported when "permanent mode" is selected. Options:

Disable

Disable=1/Enable=0

Disable=0/Enable=1

When enabled, the following parameters are visible.

--Parameter “Behaviour on enable”

This parameter sets the behavior when the group is enabled. Options:

Unchange

Switch on

Switch off

Unchange: The group output is unchange.

Switch on: The group output performs the switch on operation.

Switch off: The group output performs the switch off operation.

--Parameter "Behaviour on disable"

This parameter sets the behavior when the group is disabled. Options:

Unchange

Switch on

Switch off

Unchange: The group output is unchange.

Switch on: The group output performs the switch on operation.

Switch off: The group output performs the switch off operation.

Parameter "Colour control function"

This parameter sets whether to enable the colour control function. For details of the parameters when enabled, see Section 5.5.2.

Parameter "Group scene function"

This parameter sets whether to enable the group scene function. For details of the parameters when enabled, see Section 5.5.3.

5.5.1.2 Operation mode "Normal/Night mode"

This section only describes the parameter settings under the normal/night mode.

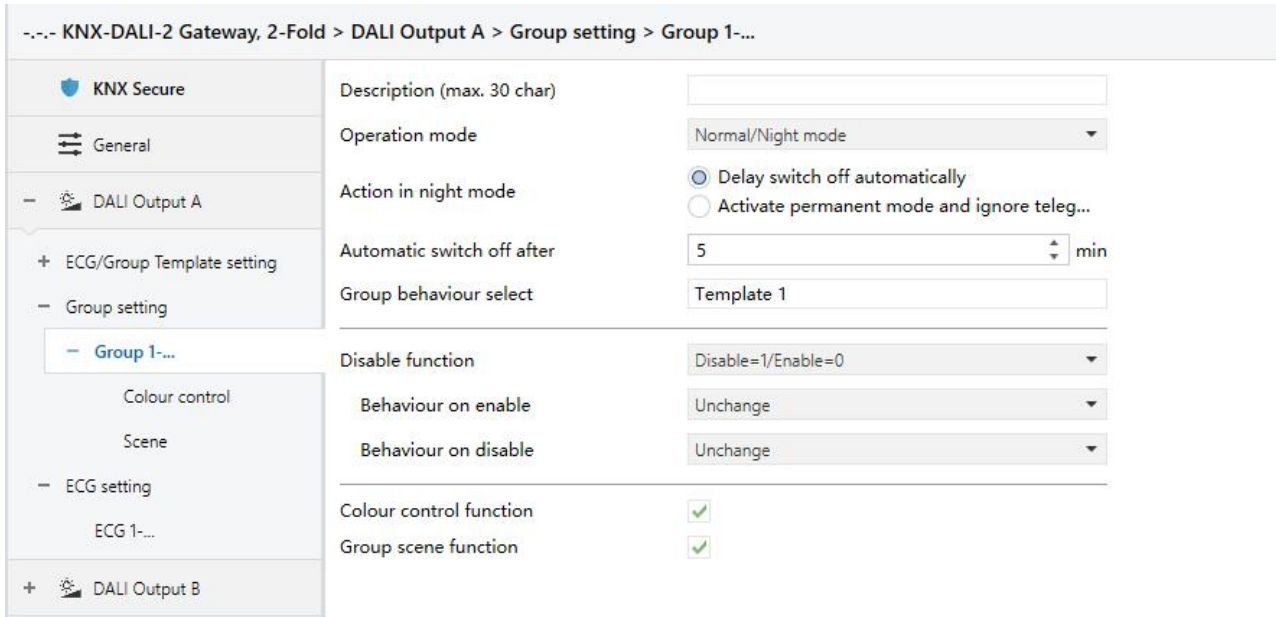


Fig.5.5.1.2 "Norma/Night mode"

Parameter "Action in night mode"

This parameter sets the action behavior in night mode. Options:

Delay switch off automatically

Activate permanent mode and ignore telegrams

Delay switch off automatically：The lamp will be automatically turned off after a delay time when it is turned on. If the lamp is on before switching to the night mode, after switching, the lamp will be automatically turned off when reach to the delay time.

Note：When switching to normal mode, the lamp status is maintained.

Activate permanent mode and ignore telegram： Activates permanent mode and ignores the control telegram, i.e outputs with a fixed brightness value.

Note：When switching to normal mode, the lamp status is maintained.

Parameter "Automatic switch off after"

This parameter is visible when the previous parameter selects “Delay switch off automatically”. Set the delay time for the DALI device in the group to automatically turn off the lamp. Options:

1min

2min

...

255min

Parameter "Brightness value in permanent mode"

This parameter is visible when option "Activate permanent mode and ignore telegram" of the parameter "Action in night mode" is selected. Setting the output brightness value of the DALI device in the group when under the permanent mode. Options:

0%

5%

...

100%

5.5.1.3 Operation mode “Staircase mode”

This section only describes the parameter settings under the staircase mode.

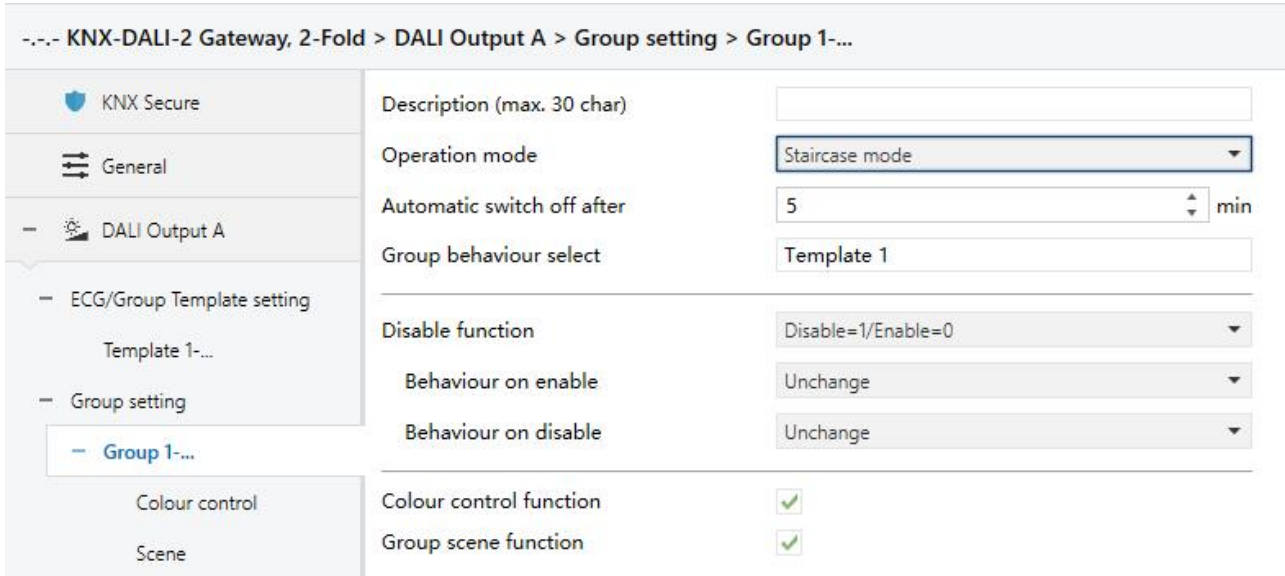


Fig.5.5.1.3 “Staircase mode”

Parameter “Automatic switch off after”

This parameter setting the delay time to automatically turn off the lamp after DALI device in the group is turned on. Options:

1min

2min

...

255min

5.5.1.4 Operation mode “Permanent mode”

This section only describes the parameter settings under the permanent mode.

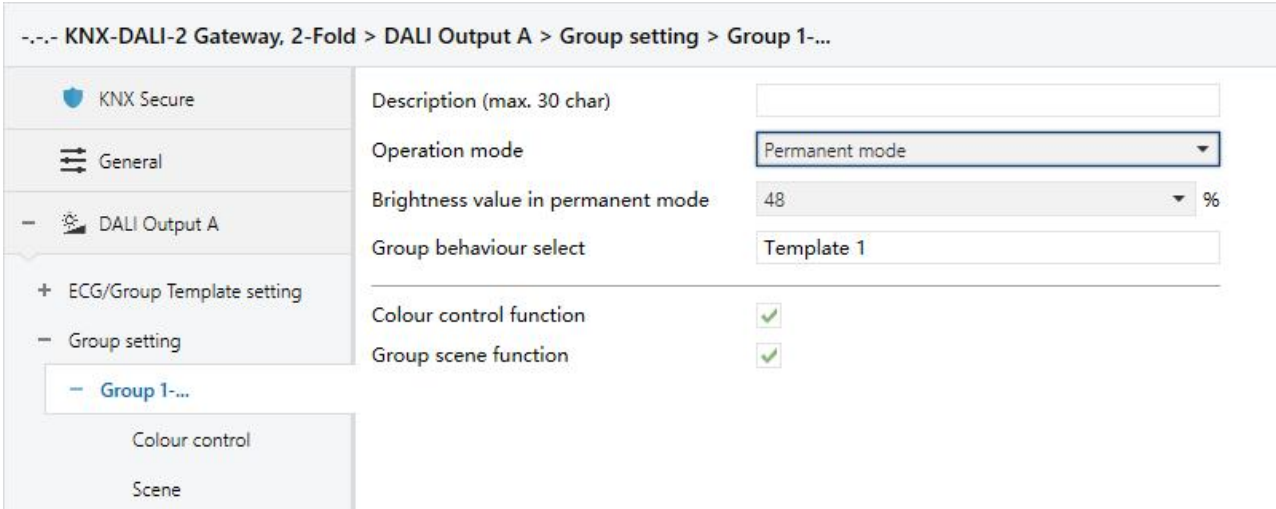


Fig.5.5.1.4 “Permanent mode”

Parameter “Brightness value in Permanent mode”

This parameter sets the brightness value of the DALI device output in the group under the permanent mode. Options:

0%

5%

...

100%

Parameter “Colour control function”

This parameter sets whether to enable the colour control function. For details of the parameters when enabled, see Section 5.5.2.

--Parameter “Group scene function”

This parameter is visible when the previous parameter is enabled, sets whether to enable the group scene function. For details of the parameters when enabled, see Section 5.5.3.

5.5.2 Parameter window"Colour control"

This interface is visible when "Colour control function" is enabled.

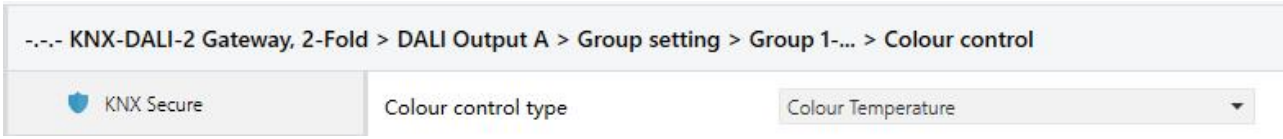


Fig.5.5.2 "Colour control"

Parameter "Colour control type"

This parameter sets the colour control type for the group. Options:

Colour Temperature

RGB Colour

RGBW Colour

XY Colour

Colour Temperature: Cool-warm colour control.

RGB Colour: RGB colour controls.

RGBW Colour: RGBW colour controls.

XY Colour: It is a method of controlling colour in colour space through two specified coordinates.

Note：The colour type of the group is required to be the same as the colour type set by the ECG in the group, otherwise control errors may occur.

5.5.2.1 Colour control type“Colour Temperature”

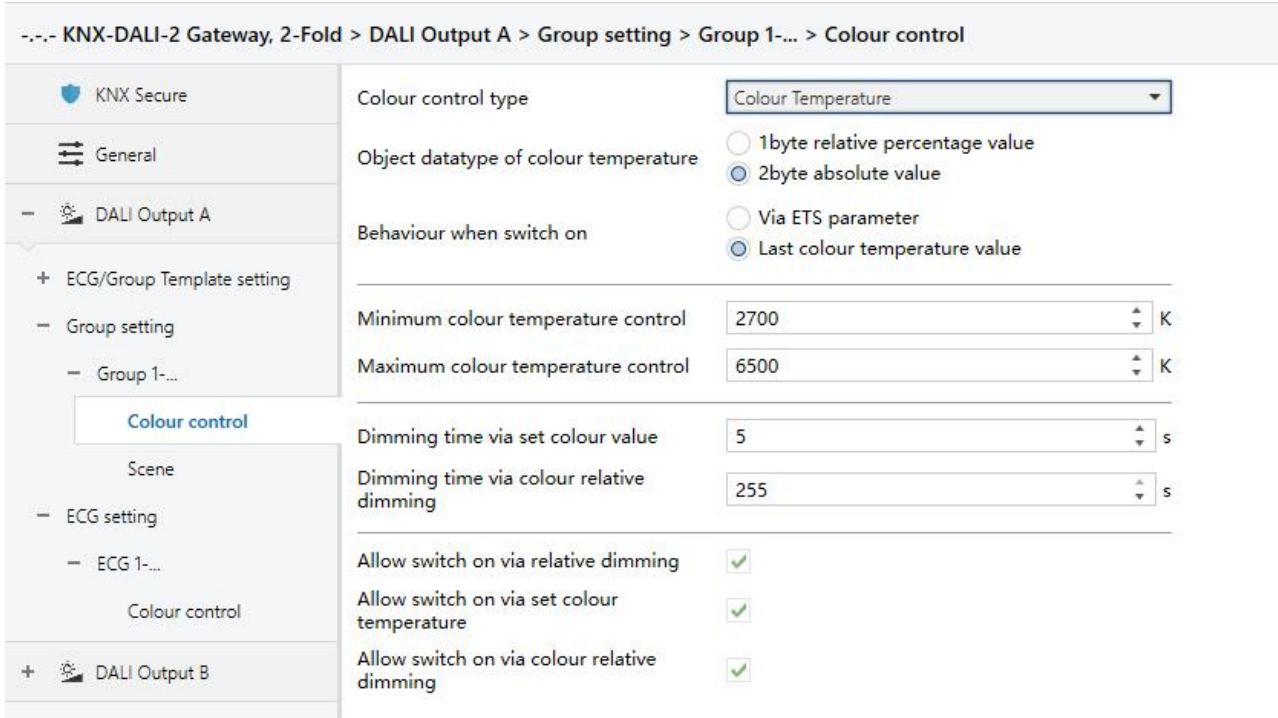


Fig.5.5.2.1 “Colour Temperature”

Parameter “Object datatype of colour temperature”

This parameter sets the object datatype of colour temperature.Options:

1byte relative percentage value

2byte absolute value

1byte relative percentage value: 0% = minimum color temperature, 100% = maximum color temperature. The value range 0-100% will automatically convert based on the colour temperature range. For example, If the colour temperature range is 1000...10000K, then a value of 50% corresponds to a color temperature of 4500K.

2byte absolute value: The colour temperature range is 1000.... .10000K.

Parameter “Behaviour when switch on”

This parameter sets the colour temperature value when the group switch is on.Options:

Via ETS parameter

Last colour temperature value

Via ETS parameter: The colour temperature when the group object "Switch" on is set by the next parameter.

Last colour temperature value: The colour temperature when the group object "Switch" on follows the last saved colour temperature value. If the value is uncertain, the default colour temperature is 4500K and brightness is 50% .

--Parameter "Colour temperature when switch on"

This parameter is visible when "Via ETS parameter" is selected, used to set the colour temperature when lamp is switch on.Options: **1000...10000K**

Parameter "Minimum colour temperature control"

Parameter "Maximum colour temperature control"

This parameter sets the minimum/maximum colour temperature control of the group output, which refers to the minimum/maximum colour temperature value controllable by the KNX-DALI-2 Gateway for lamps.

Options:

1000...10000K

The minimum value of the output colour temperature must always be less than the maximum value; if this condition is not met, the parameters on the ETS will not be set.

Parameter "Dimming time via set colour value"

This parameter defines the dimming time of the colour value. That is, the dimming time of the colour value from the lowest to the highest. Options: **0...255s**

Parameter "Dimming time via colour relative dimming"

This parameter defines the dimming time of the colour value. That is, the dimming time of the colour relative from the Minimum to the maximum..Options: **1...255s**

Parameter "Allow switch on via set colour temperature"

This parameter defines whether to allow the lamp switch on via set colour temperature .

Parameter "Allow switch on via colour relative dimming"

This parameter defines whether to allow the lamp switch on via colour relative dimming.

5.5.2.2 Colour control type"RGB Colour"

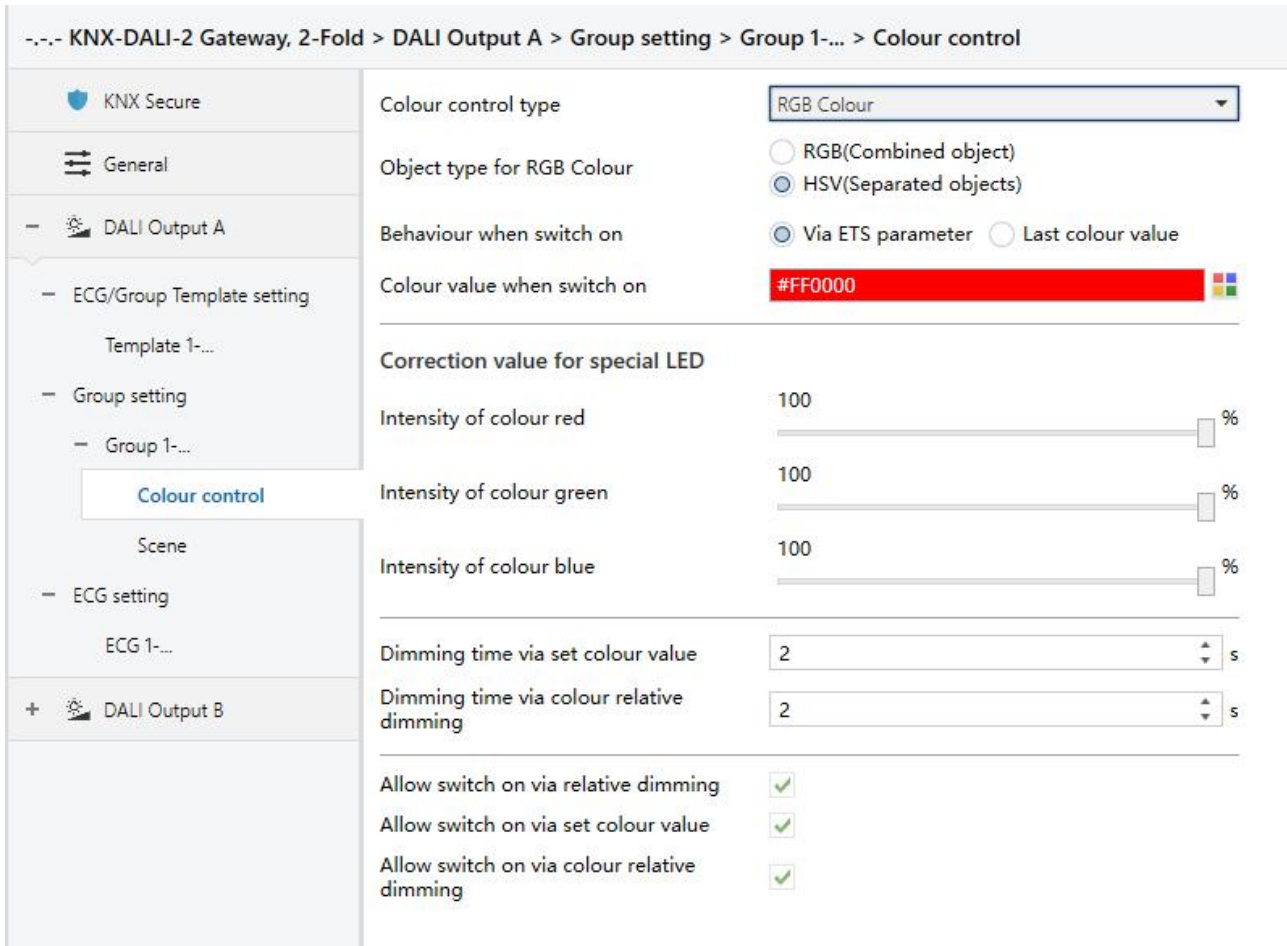


Fig.5.5.2.2 "RGB Colour "

Parameter "Object type for RGB Colour"

This parameter sets the object datatype of RGB Colour.Options:

RGB(Combined object)

HSV(Separated objects)

Parameter "Behaviour when switch on"

This parameter sets the colour temperature value when the group switch is on.Options:

Via ETS parameter

Last colour value

Via ETS parameter: The colour temperature when the group object "Switch" on is set by the next parameter.

Last colour temperature value: The colour temperature when the group object "Switch" on follows the last saved colour temperature value. If the value is undefined, the default colour is white with 50% brightness .

--Parameter "Colour value when switch on"

This parameter is visible when "Via ETS parameter" is selected, used to set the colour value when lamp is switch on. Options: **000000...FFFFFF**

Correction value for special LED

Parameter "Intensity of colour red"

Parameter "Intensity of colour green"

Parameter "Intensity of colour blue"

This parameter sets the intensity of colour red/green/blue.Options:: **0...100%**

Note: If Intensity is set to 0%, the control for this colour is disabled and the colour output is 0%.

Parameter "Dimming time via set colour value"

This parameter defines the dimming time of the RGB value. That is, the dimming time of the RGB value from 0 to 255. Options: **0...255s**

Parameter "Allow switch on via relative dimming"

This parameter defines whether to allow the lamp switch on via relative dimming .

The following parameters are visible when "HSV (Separated objects)" is selected.

Parameter "Dimming time via colour relative dimming"

This parameter defines the dimming time of the colour. That is, the dimming time of the colour relative from 0 to maximum. Options: **1...255s**

Parameter "Allow switch on via set colour value"

This parameter defines whether to allow the lamp switch on via set colour value.

Parameter "Allow switch on via colour relative dimming"

This parameter defines whether to allow the lamp switch on via colour relative dimming.

5.5.2.3 Colour control type“RGBW Colour”

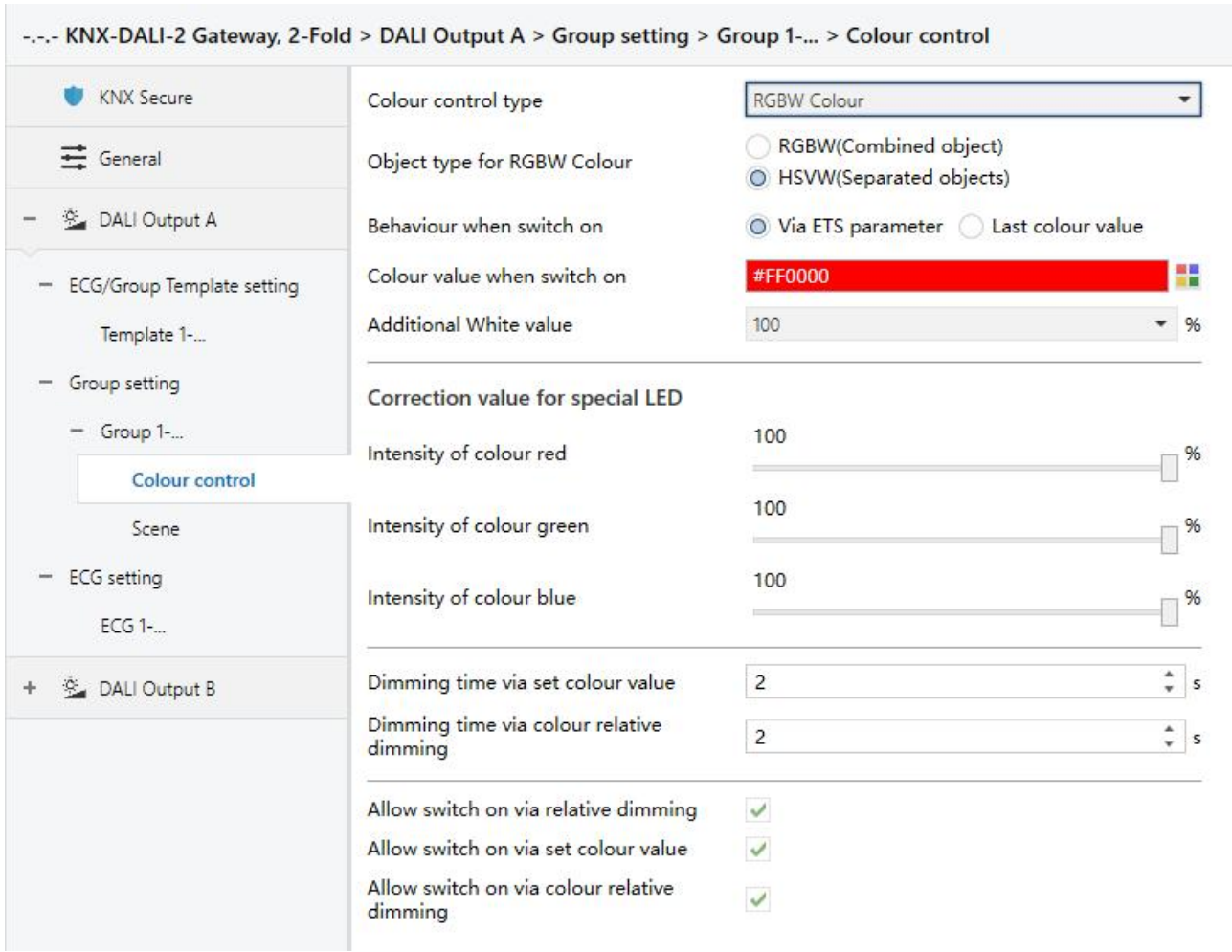


Fig.5.5.2.3 “RGBW Colour ”

Parameter “Object type for RGBW Colour”

This parameter sets the object datatype of RGBW Colour .Options:

RGBW(Combined object)

HSVW(Separated objects)

Parameter “Behaviour when switch on”

This parameter sets the colour value when the group switch is on.Options:

Via ETS parameter

Last colour value

Via ETS parameter: The colour value when the group object "Switch" turns on is set by the next parameter.

Last colour temperature value: The colour value when the group object "Switch" turns on follows the last saved colour value. If the value is undefined, the default colour is white and “W” value is 50% .

Note：The colour after programming or powering on the device follow the configuration here.

The following parameters are visible when “Via ETS parameter” is selected:

--Parameter “Colour value when switch on”

This parameter sets the colour value when switch on. Options: **000000...FFFFFF**

--Parameter “Additional White value”

This parameter sets the additional white colour value when switch on. Options: **0...100%**

Correction value for special LED

Parameter “Intensity of colour red”

Parameter “Intensity of colour green”

Parameter “Intensity of colour blue”

This parameter sets the intensity of colour red/green/blue. Options: **0...100%**

Note：If Intensity is set to 0%, the control for this colour is disabled and the colour output is 0%.

Parameter “Dimming time via set colour value”

This parameter defines the dimming time of the RGBW value. That is, the dimming time of the RGBW value from 0 to 255. Options: **0...255s**

Parameter “Allow switch on via relative dimming”

This parameter defines whether to allow the lamp switch on via relative dimming.

The following parameters are visible when "HSV(Separated objects)" is selected:

Parameter "Dimming time via colour relative dimming"

This parameter defines the dimming time of the colour relative. That is, the dimming time of the colour relative from 0 to maximum. Options: **1...255s**

Parameter "Allow switch on via set colour value"

This parameter defines whether to allow the lamp switch on via set colour value.

Parameter "Allow switch on via colour relative dimming"

This parameter defines whether to allow the lamp switch on via colour relative dimming.

5.5.2.4 Colour control type“XY Colour”

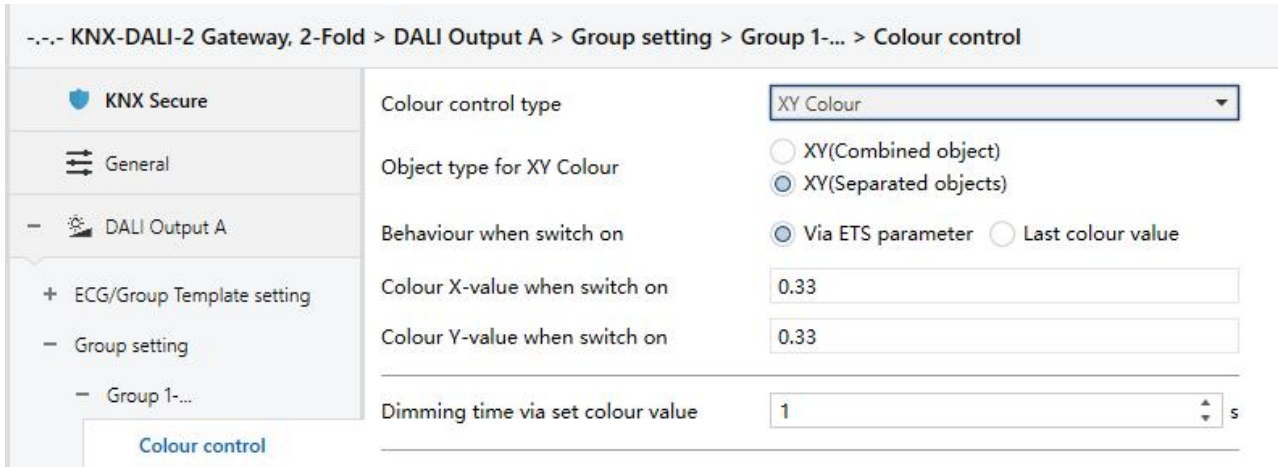


Fig.5.5.2.4 “XY Colour ”

Parameter “Object type for XY Colour”

This parameter sets the object datatype of XY Colour. Options:

XY(Combined object)

XY(Separated objects)

Parameter “Behaviour when switch on”

This parameter sets the colour value when the group switch is on. Options:

Via ETS parameter

Last colour value

Via ETS parameter: The colour value when the group object "Switch" turns on is set by the next parameter.

Last colour temperature value: The colour value when the group object "Switch" turns on follows the last saved colour value. If the value is undefined, the default colour is white with 50% brightness.

Note：The colour after programming or powering on the device follow the configuration here.

The following parameters are visible when "Via ETS parameter" is selected.

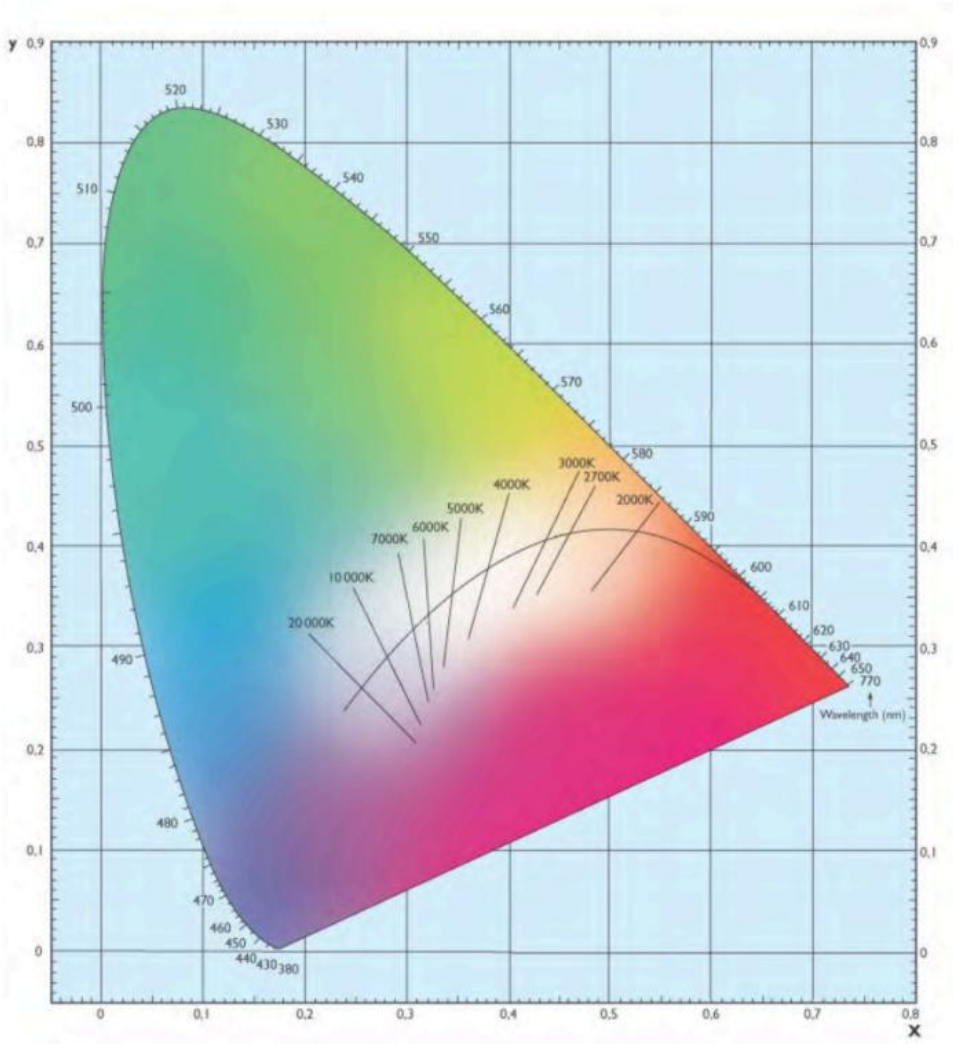
--Parameter "Colour X-value when switch on"

This parameter sets the colour X-value when switch on. Options: **0...1**

--Parameter "Colour Y-value when switch on"

This parameter sets the colour Y-value when switch on. Options: **0...1**

Note： All control values whose actual coordinates do not fall within the colour range are invalid, such as: 0.01/0.01



Parameter "Dimming time via set colour value"

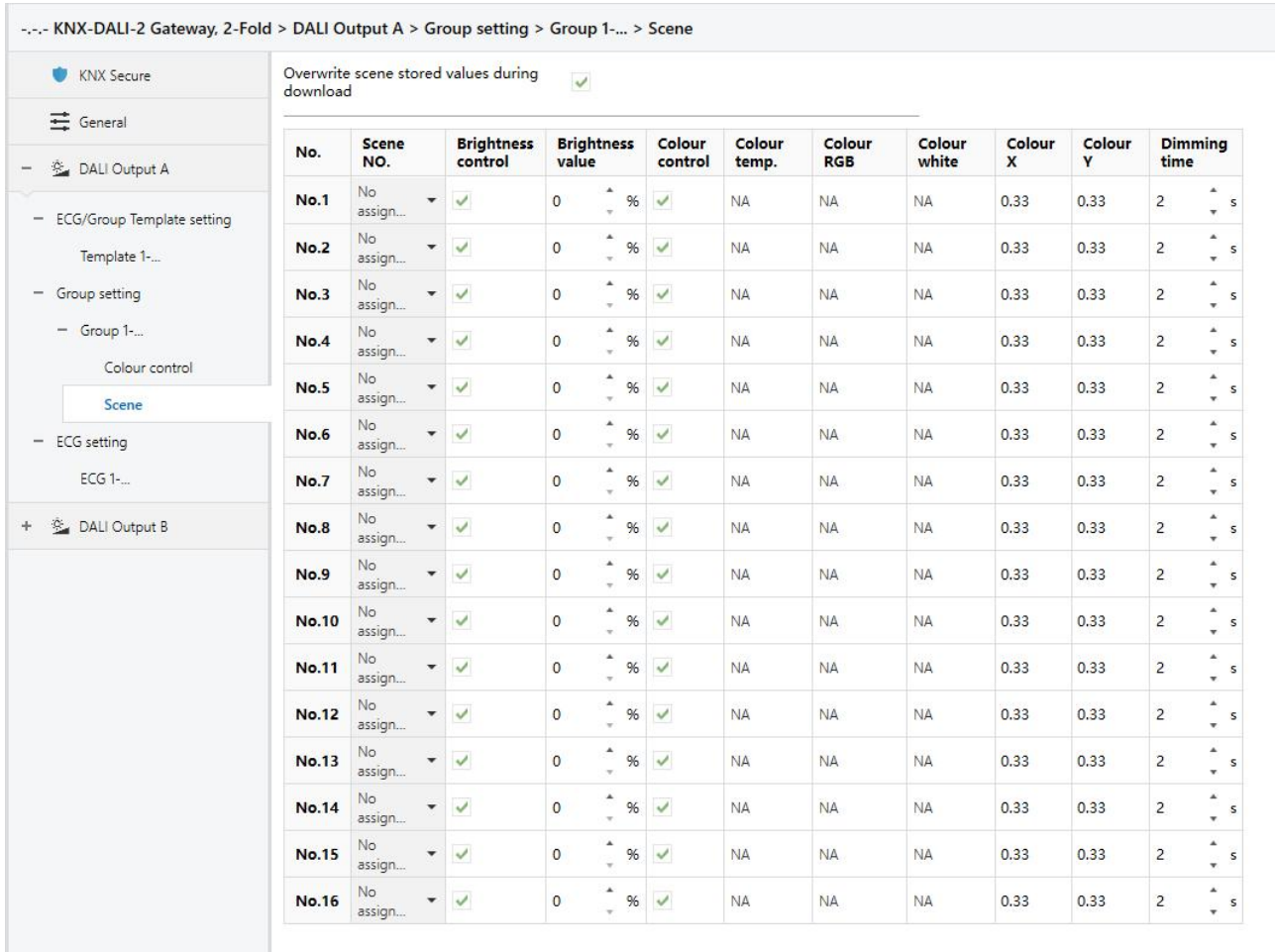
This parameter defines the dimming time of the XY colour value. That is, the dimming time of the XY value from 0 to 1. Options: **0...255s**

Parameter "Allow switch on via colour relative dimming"

This parameter defines whether to allow the lamp switch on via relative dimming.

5.5.3 Parameter window"Scene"

This interface is visible when "Group scene function" is enabled.



No.	Scene NO.	Brightness control	Brightness value	Colour control	Colour temp.	Colour RGB	Colour white	Colour X	Colour Y	Dimming time
No.1	No assign...	✓	0 %	✓	NA	NA	NA	0.33	0.33	2 s
No.2	No assign...	✓	0 %	✓	NA	NA	NA	0.33	0.33	2 s
No.3	No assign...	✓	0 %	✓	NA	NA	NA	0.33	0.33	2 s
No.4	No assign...	✓	0 %	✓	NA	NA	NA	0.33	0.33	2 s
No.5	No assign...	✓	0 %	✓	NA	NA	NA	0.33	0.33	2 s
No.6	No assign...	✓	0 %	✓	NA	NA	NA	0.33	0.33	2 s
No.7	No assign...	✓	0 %	✓	NA	NA	NA	0.33	0.33	2 s
No.8	No assign...	✓	0 %	✓	NA	NA	NA	0.33	0.33	2 s
No.9	No assign...	✓	0 %	✓	NA	NA	NA	0.33	0.33	2 s
No.10	No assign...	✓	0 %	✓	NA	NA	NA	0.33	0.33	2 s
No.11	No assign...	✓	0 %	✓	NA	NA	NA	0.33	0.33	2 s
No.12	No assign...	✓	0 %	✓	NA	NA	NA	0.33	0.33	2 s
No.13	No assign...	✓	0 %	✓	NA	NA	NA	0.33	0.33	2 s
No.14	No assign...	✓	0 %	✓	NA	NA	NA	0.33	0.33	2 s
No.15	No assign...	✓	0 %	✓	NA	NA	NA	0.33	0.33	2 s
No.16	No assign...	✓	0 %	✓	NA	NA	NA	0.33	0.33	2 s

Fig.5.5.3 Parameter window"Scene "

Parameter "Overwrite scene stored values during download"

This parameter sets whether to overwrite scene stored values during download.

Overwrite: all parameters will be refer from the settings downloaded from ETS.

Not overwrite: The brightness and color values corresponding to scene numbers that have executed learning will still be saved after downloading, and the saved values will be used when recall the scene; for new scenes, scenes with changes in the color control type, or scene numbers for which learning has not been executed, or the location of scene numbers for which learning has been

executed has been changed in the new configuration, the configuration of the ETS will take precedence.

Parameter "No."

This parameter shows the configurable scenarios.Options: **No.1...No.16**

Parameter "Scene NO."

This parameter sets the KNX scene number that triggers this group of scenes. Options:

No assignment

1

2

...

64

Parameter "Brightness control"

This parameter sets whether to enable brightness control, indicating the brightness control value that needs to be sent in this scene control.

Parameter "Brightness value"

This parameter sets the brightness value of the scene, the options are "0...100%", otherwise the default is "NA".

The brightness value cannot be set when the group's operation mode is "permanent" and object type is "HSV(Separated objects)/HSVW(Separated objects)" .

Parameter "Colour control"

This parameter sets the color value of the scene, indicating the colour control value that needs to be sent in this scene control.

Note： When controlling group scenes, at least one of the following must be sent: brightness value or color control.

Parameter "Colour temp."

This parameter sets the colour temperature value of the corresponding scene. The options are displayed according to the colour control type and can be set only if the group selection color type is **"Colour Temperature"** and the parameter **"Colour control"** is enabled. The options are **"1000...10000K"**, otherwise the default is **"NA"**.

Parameter "Colour RGB/RGBW"

This parameter sets the RGB/RGBW value of the corresponding scene. The options are displayed according to the colour control type and can be set only if the group selection color type is **"RGB /RGBW Colour"** and the parameter **"Colour control"** is enabled. The options are **"000000...FFFFFF"**, otherwise the default is **"NA"**.

Parameter "Colour White"

This parameter sets the colour white of the corresponding scene. The options are displayed according to the colour control type and can be set only if the group selection color type is **"RGBW Colour"** and the parameter **"Colour control"** is enabled. The options are **"0...100%"**, otherwise the default is **"NA"**.

Parameter "Colour X"

This parameter sets the colour X of the corresponding scene. The options are displayed according to the colour control type and can be set only if the group selection color type is **"XY Temperature"** and the parameter **"Colour control"** is enabled. The options are **"0...1"**, otherwise the default is **"NA"**.

Parameter "Colour Y"

This parameter sets the colour Y of the corresponding scene. The options are displayed according to the colour control type and can be set only if the group selection color type is **"XY Temperature"** and the parameter **"Colour control"** is enabled. The options are **"0...1"**, otherwise the default is **"NA"**.

Parameter "Dimming time"

This parameter sets the dimming time of the corresponding scene. The options are displayed according to the the parameter **"Brightness control"** is enabled. The options are **"0...255s"**, otherwise the default is **"NA"**.

5.6 Parameter window" ECG setting"

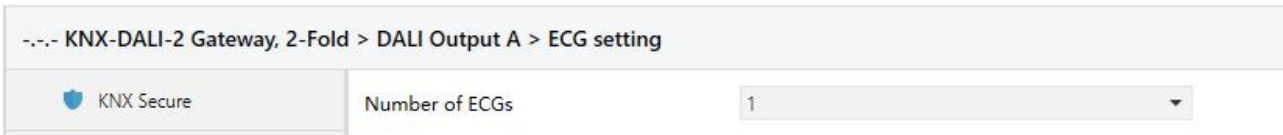


Fig.5.6 Parameter window"ECG setting"

Parameter "Number of ECGs"

This parameter sets the number of ECGs. Options:

None

1

2

...

64

Note: This parameter should be configured according to the actual ECG used. If the parameter is configured with ECG x but the device is not connected, the ECG is considered to be faulty. Therefore, it is recommended to activate this parameter based on the ECG actually used.

In addition, the ECG configured in the group also needs to be activated via this parameter, but the control behavior applies to the configuration of the group.

5.6.1 Parameter window"ECG X"(X=1~64)

Parameter setting interface "ECG X" is shown in Figure5.6.1, here for setting the control of a single DALI device.

Each channel of the KNX/DALI gateway has 64 DALI devices, and each DALI device can be individually switch, dimming, brightness value, colour temperature, colour control. At the same time, the gateway also provides functions such as operation hour calculation and burn in for DALI devices.

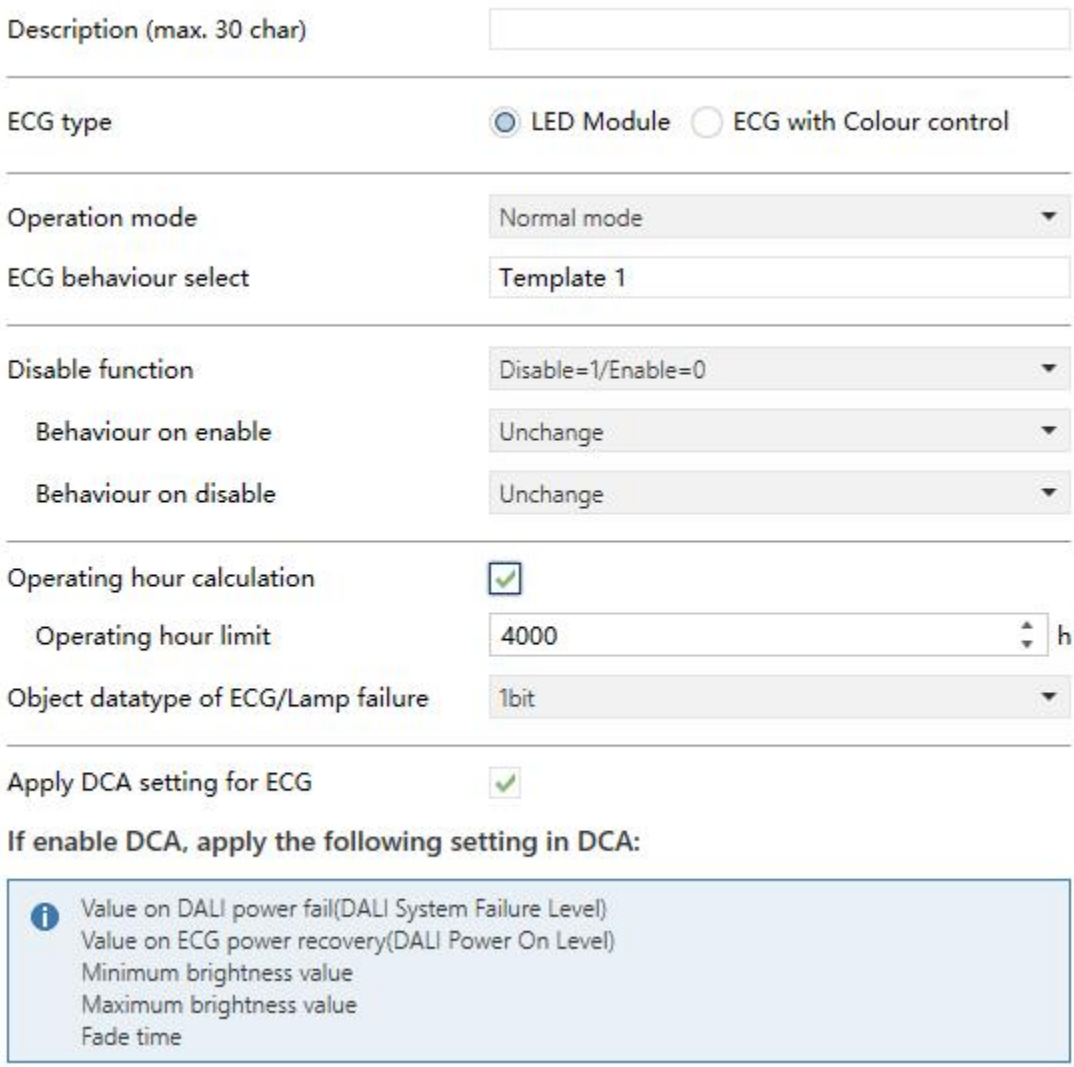


Fig.5.6.1Parameter window"ECG X"(X=1~64)

Parameter "Description (max. 30 char)"

This parameter is used to input the ECG name (up to 30 characters).

Parameter "ECG type"

This parameter sets the ECG type used. Options:

LED Module

ECG with Colour control

LED Module：ECG type is DT6.

ECG with Colour control：ECG type is DT8, with colour control. See Section 5.6.1 for detailed colour settings.

Parameter "Operating mode"

This parameter setting the operating mode of the group. Options:

Normal mode

Permanent mode

Normal/Night mode

Staircase mode

Normal mode:Common switch control of the lamp, such as switching, dimming and setting the brightness value of the DALI device in the group.

Permanent mode: The DALI device in the group outputs with a fixed brightness value, the brightness cannot be switched or changed.

Normal/Night mode: Under the normal mode, the control is the same as the first option. After switching to night mode, the lamp can be turned off in a delay time after the lamp is turned on, or output with a fixed brightness value. Activate night mode via object 2.

Staircase mode: Turn on the Staircase lighting and automatically turn off after delay time

Parameter description of each mode refers to section 5.6.1.1，5.6.1.2，5.6.1.3 and 5.6.1.4.

Parameter "ECG behaviour select--Template 1"

This parameter sets the behavior of the ECG, which is achieved by recalling the settings of the template. Options:

Template 1

...

Template 8

Parameter "Disable function"

This parameter sets the disable/enable control for the ECG.

Disable

Disable=1/Enable=0

Disable=0/Enable=1

When enabled, the following parameters are visible.

--Parameter "Behaviour on enable"

This parameter sets the behavior when the ECG is enabled. Options:

Unchange

Switch on

Switch off

Unchange: The ECG output is unchange.

Switch on: The ECG output performs the switch on operation.

Switch off: The ECG output performs the switch off operation.

--Parameter "Behaviour on disable"

This parameter sets the behavior when the ECG is disabled. Options:

Unchange

Switch on

Switch off

Unchange: The ECG output is unchange.

switch on: The ECG output performs the switch on operation.

switch off: The ECG output performs the switch off operation.

Parameter "Operating hour calculation"

This parameter setting whether to enable operation hour calculation function.

--Parameter "Operating hour limit"

This parameter is visible when the previous parameter is enable and is used to set the limit value of the lamp operation hour. When the operation hour of the lamp reaches the limit value, the object "Life time exceeded" sends an alarm to the bus. Options: **0..200000h**

Note: The operation hour record is recorded every 5 minutes. When the bus is powered off, the recording may be incomplete due to insufficient capacitance. Therefore, the power failure will cause the time record to have a few minutes of error.

Parameter "Object datatype of ECG/Lamp failure"

This parameter setting the object datatype of the ECG/Lamp failure. Options:

1bit

1byte

2byte

1bit: Does not distinguish the type of failure, whether it is a lamp failure or ECG failure, the object sends a telegram "1" to the bus.

1byte: Distinguish the failure type, bit7-ECG failure; bit6- lamp failure; bit5-bit0: ECG number 1..64.

2byte: Distinguish the failure type, bit 8 is 1 for lamp failure; bit 9 is 1 for ECG failure; bit 10 is 1 for Converter failure.

The 1 byte object value is defined as follows:

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
ECG failure	Lamp failure	ECG number1..64					

example:

1. 1000 0011 (object value 131) indicates ECG failure of ECG4;

2. 0100 0010 (object value 66) indicates lamp failure of ECG3;

This object can also be used to query the lamp and ECG failure. When the highest two bit value, both Bit7 and Bit6, of the telegram received by the object are 1, indicating to query the ECG x failure, such as:

Query the failure status of ECG3: 1100 0010 (object value 194)

If the ECG of ECG3 is faulty, the gateway will respond: 1000 0010 (object value 130)

The 2 byte object value is defined as follows:

Bit 11...Bit15	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 0-Bit 5
0	0:No error 1:Converter failure	0:No error 1:ECG failure	0:No error 1:Lamp failure	0:Response or spontaneous sending 1:Read	0:Device address 1:Group address	DALI device address :1...64 DALI group address: 0...15

Lamp failure: One or more fixtures does not working (damaged) or are not connected.

ECG failure: One or more ballasts on the output of the DALI gateway do not work or are not connected.

5.6.2 Parameter window"Colour control"

This interface is visible when "ECG with Colour control" is selected as the ECG type.

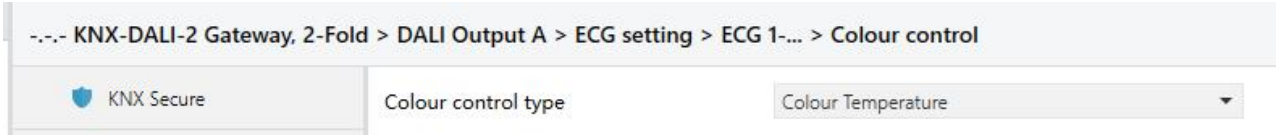


Fig.5.6.2 "Colour control"

Parameter "Colour control type"

This parameter sets the colour control type for the group. Options:

Colour Temperature

RGB Colour

RGBW Colour

XY Colour

Colour Temperature: Cool-warm colour control.

RGB Colour: Three RGB colour controls.

RGBW Colour: Four RGBW colour controls.

XY Colour: It is a method of controlling colour in colour space through two specified coordinates.

5.6.2.1 Colour control type“Colour Temperature”

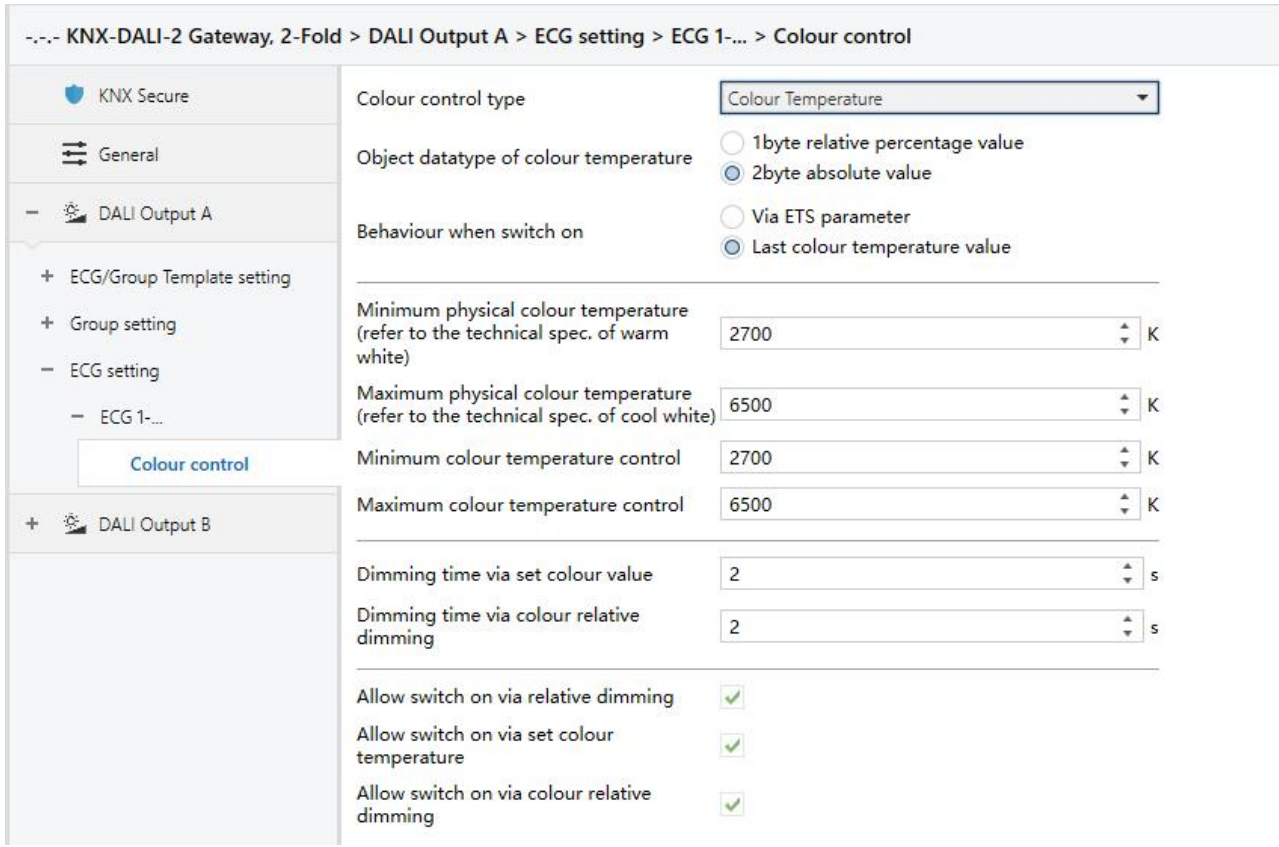


Fig.5.6.2.1 “Colour Temperature”

Parameter “Object datatype of colour temperature”

This parameter sets the object datatype of colour temperature.Options:

1byte relative percentage value

2byte absolute value

Parameter “Behaviour when switch on”

This parameter sets the colour temperature value when the group switch is on.Options:

Via ETS parameter

Last colour temperature value

Via ETS parameter: The colour temperature when the group object "Switch" on is set by the next parameter.

Last colour temperature value: The colour temperature when the group object "Switch" on follows the last saved colour temperature value. If the value is undefined, the default colour temperature is 4500K and brightness is 50% .

--Parameter "Colour temperature when switch on"

This parameter is visible when "Via ETS parameter" is selected, used to set the colour temperature when lamp is switch on.Options: **1000...10000K**

Parameter "Minimum physical colour temperature (refer to the technical spec. Of warm white)"

Parameter "Maximum physical colour temperature control (refer to the technical spec. Of warm white)"

This parameter sets the minimum/maximum physical colour temperature of the group output, which refers to the minimum/ maximum colour temperature value of the lamps itself, typically the colour temperature of warm/cool white LEDs.

Options:**1000...10000K**

The minimum value of the output physical colour temperature must always be less than the maximum value; if this condition is not met, the parameters on the ETS will not be set.

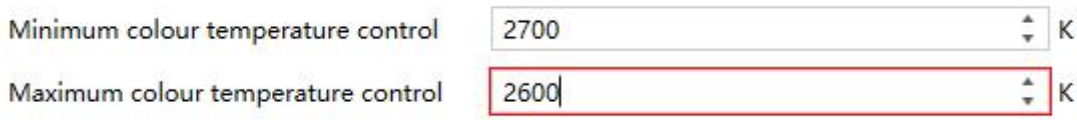
Parameter "Minimum colour temperature control"

Parameter "Maximum colour temperature control"

This parameter sets the minimum/maximum colour temperature control of the group output, which refers to the minimum/maximum colour temperature value controllable by the KNX-DALI-2 Gateway for lamps.

Options:**1000...10000K**

The minimum value of the output colour temperature must always be less than the maximum value; if this condition is not met, the parameters on the ETS will not be set.



Parameter "Dimming time via set colour value"

This parameter defines the dimming time of the colour value. That is, the dimming time of the colour value from the lowest to the highest. Options: **0...255s**

Parameter "Dimming time via colour relative dimming"

This parameter defines the dimming time of the colour value. That is, the dimming time of the colour relative from the minimum to the maximum.Options: **1...255s**

Parameter "Allow switch on via set colour temperature"

This parameter defines whether to allow the lamp switch on via set colour temperature .

Parameter "Allow switch on via colour relative dimming"

This parameter defines whether to allow the lamp switch on via relative dimming.

5.6.2.2 Colour control type“RGB Colour”

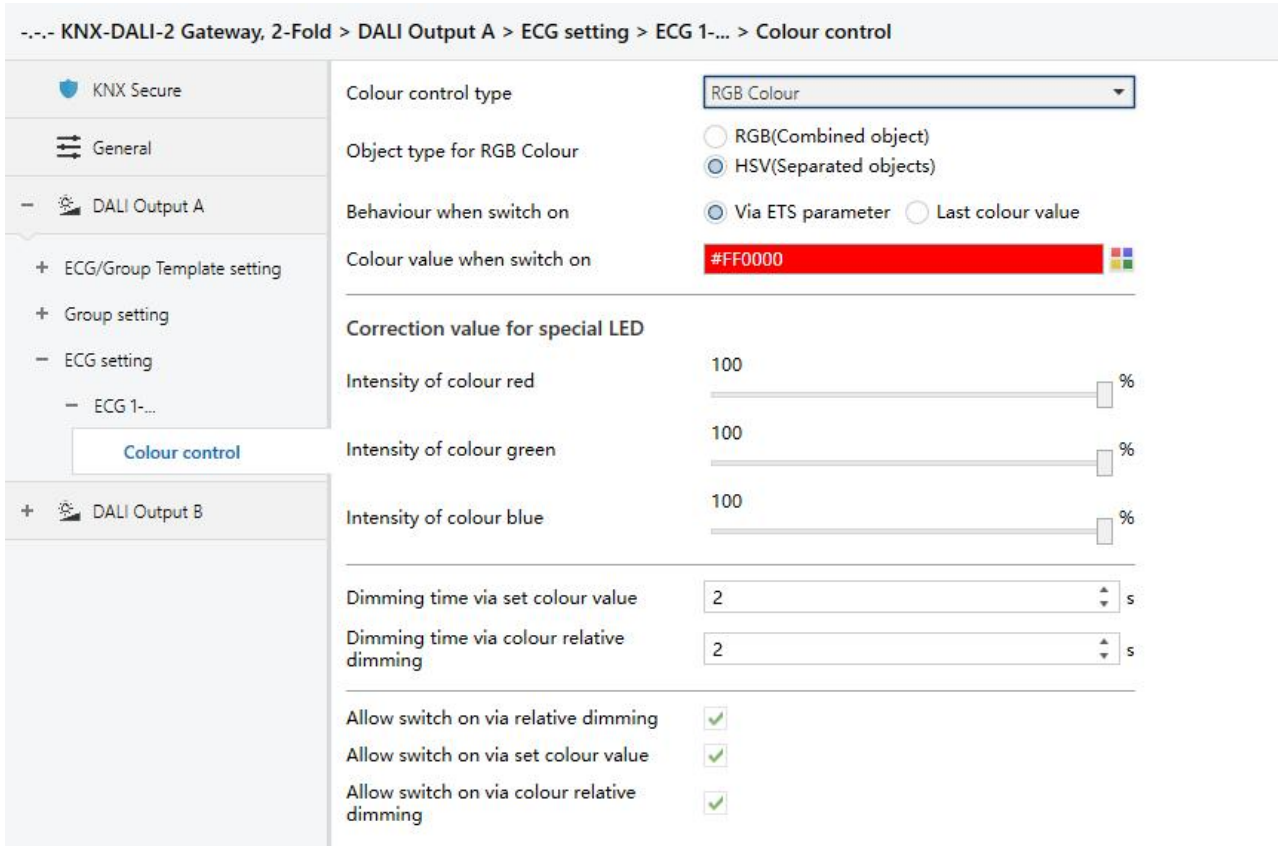


Fig.5.6.2.2 “RGB Colour ”

Parameter “Object type for RGB Colour”

This parameter sets the object datatype of RGB Colour.Options:

RGB(Combined object)

HSV(Separated objects)

Parameter “Behaviour when switch on”

This parameter sets the colour temperature value when the group switch is on.Options:

Via ETS parameter

Last colour value

Via ETS parameter: The colour temperature when the group object "Switch" on is set by the next parameter.

Last colour value: The colour temperature when the group object "Switch" on follows the last saved colour temperature value. If the value is uncertain, the default colour is white with 50% brightness .

--Parameter "Colour value when switch on"

This parameter is visible when "Via ETS parameter" is selected, used to set the colour value when lamp is switch on. Options: **000000...FFFFFF**

Correction value for special LED

Parameter "Intensity of colour red"

Parameter "Intensity of colour green"

Parameter "Intensity of colour blue"

This parameter sets the intensity of colour red/green/blue. Options: **0...100%**

Note: If Intensity is set to 0%, the control for this colour is disabled and the colour output is 0%.

Parameter "Dimming time via set colour value"

This parameter defines the dimming time of the RGB value. That is, the dimming time of the RGB value from 0 to 255. Options: **0...255s**

Parameter "Allow switch on via relative dimming"

This parameter defines whether to allow the lamp switch on via relative dimming .

The following parameters are visible when "HSV (Separated objects)" is selected.

Parameter "Dimming time via colour relative dimming"

This parameter defines the dimming time of the colour value. That is, the dimming time of the colour relative from 0 to maximum.Options:**1...255s**

Parameter "Allow switch on via set colour value"

This parameter defines whether to allow the lamp switch on via set colour value.

Parameter "Allow switch on via colour relative dimming"

This parameter defines whether to allow the lamp switch on via colour relative dimming.

5.6.2.3 Colour control type"RGBW Colour"

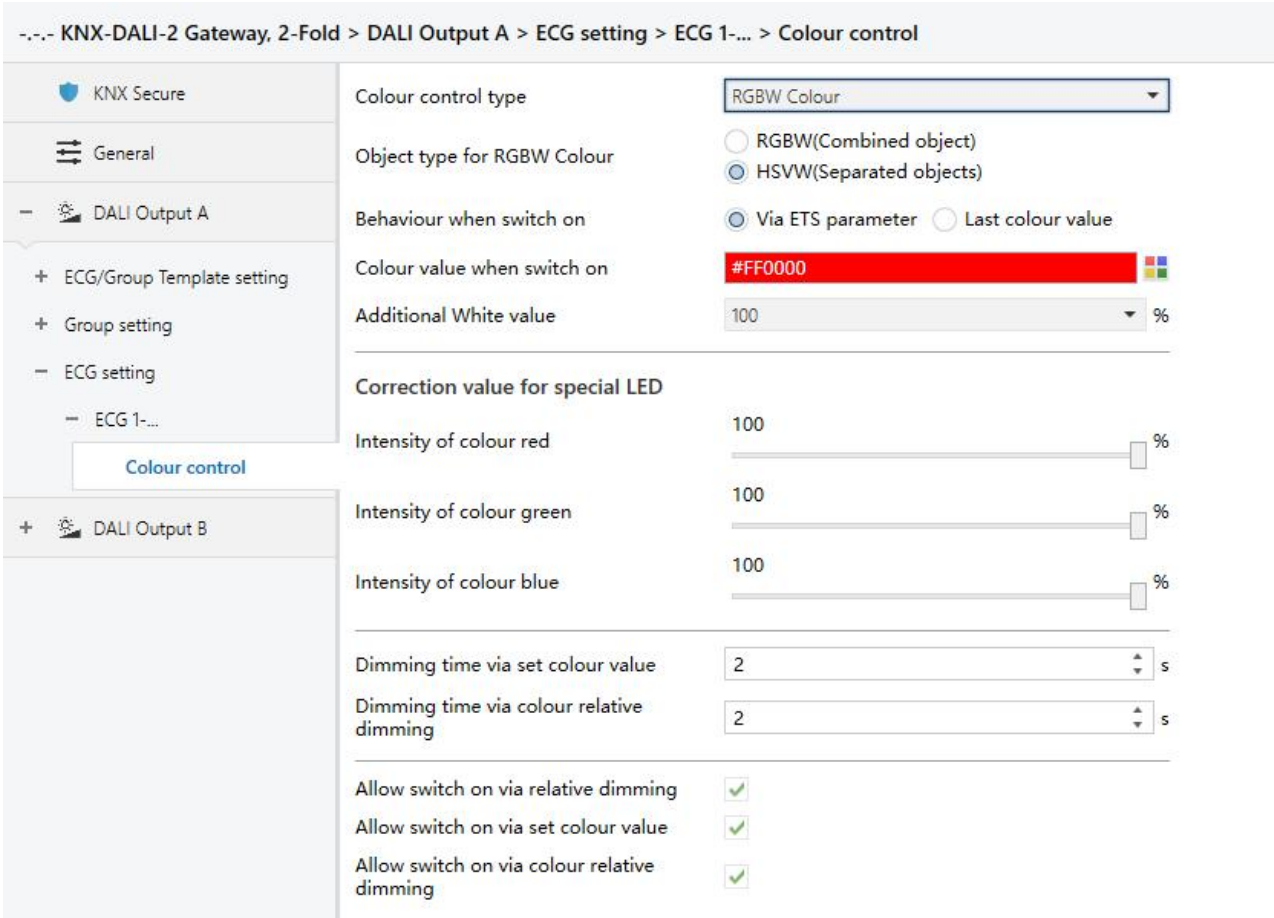


Fig.5.6.2.3 "RGBW Colour "

Parameter "Object type for RGBW Colour"

This parameter sets the object datatype of RGBW Colour .Options:

RGBW(Combined object)

HSVW(Separated objects)

Parameter "Behaviour when switch on"

This parameter sets the colour temperature value when the group switch is on.Options:

Via ETS parameter

Last colour value

Via ETS parameter: The colour temperature when the group object "Switch" turns on is set by the next parameter.

Last colour value: The colour temperature when the group object "Switch" turns on follows the last saved colour temperature value. If the value is undefined, the default colour is white and "W" value is 50% .

Note：The colour after programming or powering on the device follow the configuration here.

The following parameters are visible when "Via ETS parameter" is selected:

--Parameter "Colour value when switch on"

This parameter sets the colour value when switch on.Options:**000000...FFFFFF**

--Parameter "Additional White value"

This parameter sets the additional white colour value when switch on.Options:**0...100%**

Correction value for special LED

Parameter "Intensity of colour red"

Parameter "Intensity of colour green"

Parameter "Intensity of colour blue"

This parameter sets the intensity of colour red/green/blue. Options: **0...100%**

Note：If Intensity is set to 0%, the control for this colour is disabled and the colour output is 0%.

Parameter "Dimming time via set colour value"

This parameter defines the dimming time of the RGBW value. That is, the dimming time of the

RGBW value from 0 to 255. Options: **0...255s**

Parameter "Allow switch on via relative dimming"

This parameter defines whether to allow the lamp switch on via relative dimming.

The following parameters are visible when "HSV(Separated objects)" is selected.

Parameter "Dimming time via colour relative dimming"

This parameter defines the dimming time of the colour value. That is, the dimming time of the colour relative from 0 to maximum. Options: **1...255s**

Parameter "Allow switch on via set colour value"

This parameter defines whether to allow the lamp switch on via set colour value.

Parameter "Allow switch on via set colour relative dimming"

This parameter defines whether to allow the lamp switch on via colour relative dimming.

5.6.2.4 Colour control type“XY Colour”

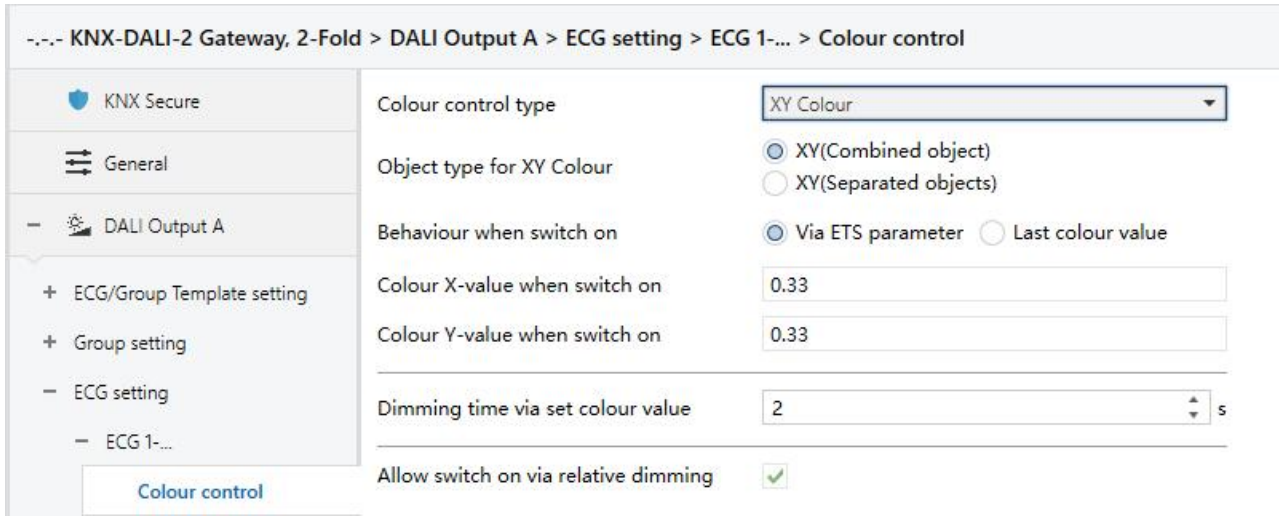


Fig.5.6.2.4 “XY Colour ”

Parameter “Object type for XY Colour”

This parameter sets the object datatype of XY Colour.Options:

XY(Combined object)

XY(Separated objects)

Parameter “Behaviour when switch on”

This parameter sets the colour temperature value when the group switch is on.Options:

Via ETS parameter

Last colour value

Via ETS parameter: The colour temperature when the group object "Switch" turns on is set by the next parameter.

Last colour value: The colour temperature when the group object "Switch" turns on follows the last saved colour temperature value. If the value is uncertain, the default colour is white with 50% brightness.

Note：The colour after programming or powering on the device follow the configuration here.

The following parameters are visible when "Via ETS parameter" is selected.

--Parameter "Colour X-value when switch on"

This parameter sets the colour X-value when switch on. Options: **0...1**

--Parameter "Colour Y-value when switch on"

This parameter sets the colour Y-value when switch on. Options: **0...1**

Note: All control values whose actual coordinates do not fall within the colour range are invalid, such as: 0.01/0.01

Parameter "Dimming time via set colour value"

This parameter defines the dimming time of the XY colour value. That is, the dimming time of the XY value from 0 to 1. Options: **0...255s**

Parameter "Allow switch on via colour relative dimming"

This parameter defines whether to allow the lamp switch on via relative dimming.

Chapter 6 Description of Communication Object

The communication object is the medium through which the device communicates with other devices on the bus, that is, only the communication object can perform bus communication. The role of each communication object is described in detail below.

Note: In the following column of the table attribute, "C" means to enable the communication function of the communication object, "W" means that the communication object value can be rewritten by the bus, "R" means that the communication object value can be read by the bus, "T" means that the communication object has a transmission function, "U" means that the communication object value can be updated.

In DALI control, a group address cannot connect too many communication objects, because the DALI protocol baud rate is only 1.2k, relatively low, allowing up to 7 communication objects to be connected to a group address, otherwise the control may be abnormal, such as it takes a few seconds for the control to complete.

6.1 General Communication Object

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
1	General	In operation			1 bit	C	R	-	T	-	switch	Low

Fig.6.1 “General” Communication object

NO.	Name	Object function	Types	Attributes	DPT
1	**General**	**In operation**	**1bit**	**C,R,T**	**1.001 switch**
This communication object is used to periodically send a telegram "1" to the bus to indicate that the device is functioning properly. This communication object is always enabled.					

Table 6.1 “General” Communication object

6.2 Channel General Communication Object

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
2	Output A General	Normal(day)/Night mode			1 bit	C	-	W	-	-	day/night	Low
3	Output A General	Burn In function			1 bit	C	-	W	-	-	start/stop	Low
4	Output A General	DALI short circuit			1 bit	C	R	-	T	-	alarm	Low
5	Output A General	DALI power supply			1 bit	C	R	-	T	-	alarm	Low
6	Output A General	General failure			1 bit	C	R	-	T	-	alarm	Low
7	Output A General	Lamp/ECG Failure status			1 byte	C	-	W	T	-	diagnostic value	Low
8	Output A General	General failure exceeds threshold			1 bit	C	R	-	T	-	alarm	Low
9	Output A General	General failure in Total			1 byte	C	R	-	T	-	counter pulses (0..255)	Low
10	Output A General	Lamp failure exceeds threshold			1 bit	C	R	-	T	-	alarm	Low
11	Output A General	Lamp failure in Total			1 byte	C	R	-	T	-	counter pulses (0..255)	Low
12	Output A General	ECG failure exceeds threshold			1 bit	C	R	-	T	-	alarm	Low
13	Output A General	ECG failure in Total			1 byte	C	R	-	T	-	counter pulses (0..255)	Low
14	Output A General	Read DALI bus voltage(V)			4 bytes	C	R	-	-	-	electric potential (V)	Low
15	Output A General	Read DALI bus current(mA)			2 bytes	C	R	-	-	-	current (mA)	Low
16	Output A General	KNX scene			1 byte	C	-	W	-	-	scene control	Low
22	Output A Broadcast	Switch			1 bit	C	-	W	-	-	switch	Low
23	Output A Broadcast	Brightness dimming			1 byte	C	-	W	-	-	percentage (0..100%)	Low
24	Output A Broadcast	Absolute colour temperature			2 bytes	C	-	W	-	-	absolute colour temperature (K)	Low
1851	Output A General	DALI scene			1 byte	C	-	W	-	-	scene control	Low
24	Output A Broadcast	HSV Hue(H) value			1 byte	C	-	W	-	-	angle (degrees)	Low
25	Output A Broadcast	HSV Saturation(S) value			1 byte	C	-	W	-	-	percentage (0..100%)	Low
26	Output A Broadcast	White colour value			1 byte	C	-	W	-	-	percentage (0..100%)	Low

Fig.6.2 “X: General” Communication object

NO.	Name	Object function	Types	Attributes	DPT
2	**Output X - General**	**Normal(day)/Night mode**	**1bit**	**C,W**	**1.024 day/night**
This communication object is used to enable or disable night mode via the bus.The object value is defined by the parameter "Normal (day)/Night mode".					
3	**Output X - General**	**Burn In function**	**1bit**	**C,W**	**1.010 start/stop**
This communication object is used to enable or disable automatic burn in of the group. During the burn in process, all other switch, dimming or brightness value setting telegrams are ignored and the lamp is all on. Burn in is usually done automatically after the configured burn in time. If the burn in is stopped by this object, the burn in time will also stop timing, and the burn in will need to be re-opened by this object, and the timing will start again.					
4	**Output X - General**	**DALI short circuit**	**1bit**	**C,R,T**	**1.005 alarm**
This communication object is used to report whether there is a short circuit in the connected DALI					

bus. Telegram:

1——A short circuit or over-current condition occurs at the DALI communication terminal

0——DALI communication terminal returns to normal

5	**Output X - General**	**DALI power supply**	**1byte**	**C,R,T**	**1.005 alarm**

The communication object is visible when “Failure object DALI power supply" is enable.Used to report abnormality of DALI power supply. Telegram:

1——Failure

0——Normal

6	**Output X - General**	**General failure**	**1bit**	**C,R,T**	**1.005 alarm**

This communication object is used to report failures on the DALI bus. When any type of failure occurs, the object will send a telegram "1" to the bus, and the failure will be cleared to "0".

7	**Output X - General**	**Lamp/ECG Failure status**	**1byte**	**C,W,T**	**238.600 DALI Diagnostics**

The communication object is visible when “Central failure object "Lamp/ECG Failure status" is enable. Used to send the lamp or ECG failure status.

The bits of the 1byte object are defined as follows：

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
ECG failure	Lamp failure	ECG Number 1..64(value 0..63)					

Example：

1. 1000 0011 (object value 131) represents the ECG failure of ECG4;

2. 0100 0010 (object value 66) represents the ECG failure of ECG3;

This object can also be used to query the lamp and ECG failure. When the highest two bit value, both Bit7 and Bit6, of the telegram received by the object are 1, indicating to query the ECG x failure, such as:

Query the failure status of ECG3: 1100 0010 (object value 194)

If the ECG of ECG3 is faulty, the gateway will respond: 1000 0010 (object value 130)					
8	**Output X - General**	**General failure exceeds threshold**	**1bit**	**C,R,T**	**1.005 alarm**
This communication object is used to report that the total number of all lamps and ECG failures exceeds the set threshold.					
9	**Output X - General**	**General failure in Total**	**1byte**	**C,R,T**	**5.010 counter pulses**
This communication object is used to report the total number of all lamps and ECG failures. **Note: When the ECG fails, the lamp will be faulty at the same time. It will only be counted once. Because the ECG is faulty, the lamp failure cannot be recognized or counted.**					
9	**Output X - General**	**General failure in %**	**1byte**	**C,R,T**	**5.001 percentage(0..100%)**
This communication object is used to report the failure rate, which is the percentage of the total number of devices on the DALI bus. All lamps and ECGs are taken into account. **Note: When the ECG fails, the lamp will be faulty at the same time. It will only be counted once. Because the ECG is faulty, the lamp failure is not recognized or counted.**					
10	**Output X - General**	**Lamp failure exceeds threshold**	**1bit**	**C,R,T**	**1.005 alarm**
This communication object is used to report that the total number of all lamp failures identified by the gateway exceeds the set threshold.					
11	**Output X - General**	**Lamp failure in Total**	**1byte**	**C,R,T**	**5.010 counter pulses**
This communication object is used to report the total number of all lamp failures identified by the gateway.					
11	**Output X - General**	**Lamp failure in %**	**1byte**	**C,R,T**	**5.001 percentage(0..100%)**
This communication object is used to report the failure rate, which is the percentage of faulty					

lamps in all lamps on the DALI bus.					
12	**Output X - General**	**ECG failure exceeds threshold**	**1bit**	**C,R,T**	**1.005 alarm**
This communication object is used to report that the total number of all ECG failures identified by the gateway exceeds the set threshold.					
13	**Output X - General**	**ECG failure in Total**	**1byte**	**C,R,T**	**5.010 counter pulses**
This communication object is used to report the total number of all ECG failures identified by the gateway.					
13	**Output X - General**	**ECG failure in %**	**1byte**	**C,R,T**	**5.001 percentage(0..100%)**
This communication object is used to report the failure rate, i.e the percentage of the faulty ECG to the total number of ECGs on the DALI bus.					
14	**Output X - General**	**Read DALI bus voltage(V)**	**4byte**	**C,R**	**14.027 electric potential(V)**
The communication object is visible when "Read DALI bus voltage" is enable. Used to read the DALI bus voltage.					
15	**Output X - General**	**Read DALI bus current(mA)**	**2byte**	**C,R**	**7.012 current(mA)**
The communication object is visible when "Read DALI bus current" is enable. Used to read the DALI bus current.					
16	**Output X - General**	**KNX scene**	**1byte**	**C,W**	**18.001 scene control**
This communication object is used to recall or store a global scene. Up to 16 scenes are available for the DALI gateway. The KNX scene number is defined as follows: Set an 8bit instruction as (binary code): FXNNNNNN F: call the scene for '0'; store the scene for '1';					

X:0;

NNNNNN: Scene number (0...63).

The parameter setting option is 1~64. In fact, the scene telegram received by the communication object "Scene" corresponds to 0~63. As follows：

Scene number	Call the message value of the scene object	Store the message value of the scene object
Scene 1	0	128
Scene 2	1	129
Scene 3	2	130
…	…	…
Scene 64	63	191

Such as setting the scene 1 of this parameter, the scene telegram received by the communication object "Scene" should be 0.

22	**Output X - Broadcast**	**Switch**	**1bit**	**C,W**	**1.001 switch**

The communication object is visible when “Broadcast control function” is enable. Used for broadcast control and can turn all connected lamps on the channel on or off. All ECGs can be switched at the same time, and the brightness value of the on is 100%, and the brightness value of the off is 0%. Telegram:

1——ON

0——OFF

If the ECG works in the permanent mode, after the broadcast control is turned on, if the ECG brightness read by the gateway from the DALI bus does not match the brightness of the permanent mode, the brightness will become the brightness of the normal mode again.

23	**Output X - Broadcast**	**Brightness dimming**	**1byte**	**C,W**	**5.001 percentage(0..100%)**
This communication object is used for broadcast control to set a specific brightness value for all connected lamps on the channel. Telegram：0…100%					
24	**Output X - Broadcast**	**Absolute colour temperature**	**2byte**	**C,W**	**7.600 absolute colour temperature**
This communication object is visible when "Colour Temperature" is selected for the colour control type. Used for broadcasting colour control.					
24	**Output X - Broadcast**	**RGB colour value** **RGBW colour value** **HSV Hue(H) value**	**3byte** **6byte** **1byte**	**C,W**	**232.600 RGB value 3x(0..255)** **251.600 RGBW value4x(0...100%)** **5.003 angle(degrees)**
24	**Output X - Broadcast**	**Colour XY value** **Colour X value**	**6byte** **2byte**	**C,W**	**242.600 Colour xyY** **7.001 pulses**
25	**Output X - Broadcast**	**Colour Y value**	**2byte**	**C,W**	**7.001 pulses**
25	**Output X - Broadcast**	**HSV Saturation(S) value**	**1byte**	**C,W**	**5.001 percentage**
26	**Output X - Broadcast**	**White colour value**	**1byte**	**C,W**	**5.001 percentage**
Displays objects according to the colour control type. Used for broadcasting colour control. RGB colour value: Setting the RGB value RGBW colour value: Setting the RGBW value White colour value: Setting the White colour value					

HSV Hue(H) value: Setting the HSV Hue(H) value
HSV Saturation(S) value: Setting the HSV Saturation(S) value
Colour XY value: Setting the XY value
Colour X value:Setting the X value
Colour Y value:Setting the Y value

Table 6.2 “X: General” Communication object

6.3 Channel Communication Object of a Single Group

There are 16 groups in the channel. The communication objects of each group are the same and independent of each other. Let's take one of them as an example:

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
27	Output A Group 1-...	Disable function			1 bit	C	-	W	-	-	enable	Low
28	Output A Group 1-...	Switch			1 bit	C	-	W	-	-	switch	Low
29	Output A Group 1-...	Relative dimming			4 bit	C	-	W	-	-	dimming control	Low
30	Output A Group 1-...	Brightness dimming			1 byte	C	-	W	-	-	percentage (0..100%)	Low
31	Output A Group 1-...	Switch status			1 bit	C	R	-	T	-	switch	Low
32	Output A Group 1-...	Brightness status			1 byte	C	R	-	T	-	percentage (0..100%)	Low
33	Output A Group 1-...	Relative percentage colour temperature			1 byte	C	-	W	-	-	percentage (0..100%)	Low
36	Output A Group 1-...	Relative colour Temperature			4 bit	C	-	W	-	-	dimming control	Low
40	Output A Group 1-...	Relative percentage colour temperature, status			1 byte	C	R	-	T	-	percentage (0..100%)	Low
43	Output A Group 1-...	KNX Scene			1 byte	C	-	W	-	-	scene control	Low

Colour Temperature

33	Output A Group 1-...	RGB colour value			3 bytes	C	-	W	-	-	RGB value 3x(0..255)	Low
40	Output A Group 1-...	RGB colour value, status			3 bytes	C	R	-	T	-	RGB value 3x(0..255)	Low

RGB(Combined object)

33	Output A Group 1-...	HSV Hue(H) value			1 byte	C	-	W	-	-	angle (degrees)	Low
34	Output A Group 1-...	HSV Saturation(S) value			1 byte	C	-	W	-	-	percentage (0..100%)	Low
40	Output A Group 1-...	HSV Hue(H) value, status			1 byte	C	R	-	T	-	angle (degrees)	Low
41	Output A Group 1-...	HSV Saturation(S) value, status			1 byte	C	R	-	T	-	percentage (0..100%)	Low

RGB(Separated objects)

33	Output A Group 1-...	RGBW colour value			6 bytes	C	-	W	-	-	RGBW value 4x(0..100%)	Low
40	Output A Group 1-...	RGBW colour value, status			6 bytes	C	R	-	T	-	RGBW value 4x(0..100%)	Low

RGBW(Combined object)

36	Output A Group 1-...	Relative HSV Hue(H) value			4 bit	C	-	W	-	-	dimming control	Low
37	Output A Group 1-...	Relative HSV Saturation(S) value			4 bit	C	-	W	-	-	dimming control	Low
40	Output A Group 1-...	HSV Hue(H) value, status			1 byte	C	R	-	T	-	angle (degrees)	Low
41	Output A Group 1-...	HSV Saturation(S) value, status			1 byte	C	R	-	T	-	percentage (0..100%)	Low
42	Output A Group 1-...	White colour value, status			1 byte	C	R	-	T	-	percentage (0..100%)	Low

RGBW(Separated objects)

33	Output A Group 1-...	Colour XY value			6 bytes	C	-	W	-	-	colour xyY	
40	Output A Group 1-...	Colour XY value, status			6 bytes	C	R	-	T	-	colour xyY	

XY(Combined object)

33	Output A Group 1-...	Colour X value			2 bytes	C	-	W	-	-	pulses	Low
34	Output A Group 1-...	Colour Y value			2 bytes	C	-	W	-	-	pulses	Low
40	Output A Group 1-...	Colour X value, status			2 bytes	C	R	-	T	-	pulses	Low
41	Output A Group 1-...	Colour Y value, status			2 bytes	C	R	-	T	-	pulses	Low

XY(Separated objects)

Fig.6.3 “X: Group” Communication object

NO.	Name	Object function	Types	Attributes	DPT
27	**Output X - Group y{{...}}**	**Disable function**	**1bit**	**C,W**	**1.003 enable**

The communication object is visible when Disable function ” is enable.Used for group disable/enable control, the trigger value is defined by the parameter, the device reboot is enabled by default.

The name in parentheses changes with the parameter “Description (max 30char.)”. If description is empty, display “Output X - Group y{{...}}” by default. The same below.

28	**Output X - Group y{{...}}**	**Switch**	**1bit**	**C,W**	**1.001 DPT_Switch**

This communication object is used to open or close the group, y=1..16.

The value for "Switch on" can be defined by a parameter template. See section 5.4.1 for details.

29	**Output X - Group y{{...}}**	**Relative dimming**	**4bit**	**C,W**	**3.007 dimming control**

This communication object is used for relative dimming of the group. The highest bit Bit4 decides to brighten or darken, Bit 0..3 determines the dimming size, and Bit 0..3 is 0 to stop dimming. The correspondence between the value of the relatively dimming telegram and brightness chance is as follows:

Telegram value	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Decrease the brightness value	Unchange	(100%)	(50%)	(25%)	(12%)	(6%)	(3%)	(1%)
Telegram value	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Increase the brightness value	Unchange	(100%)	(50%)	(25%)	(12%)	(6%)	(3%)	(1%)

Note: In the DALI system,stop dimming is unsupported. When the gateway receives the command

of stop dimming, it will send the current brightness status to the DALI bus again.					
30	**Output X - Group y{{...}}**	**Brightness dimming**	**1byte**	**C,W**	**5.001 percentage(0..100%)**
This communication object is used to set the brightness value of the group.					
31	**Output X - Group y{{...}}**	**Switch status**	**1bit**	**C,R,T**	**1.001 Switch**
This communication object is used to send the switch status of the group. **Note: The correct feedback of the status is guaranteed only in the case of group control.**					
32	**Output X - Group y{{...}}**	**Brightness status**	**1byte**	**C,R,T**	**5.001 percentage(0..100%)**
This communication object is used to send the brightness status of the group. **Note: The correct feedback of the status is guaranteed only in the case of group control.**					
33	**Output X - Group y{{...}}**	**Absolute colour temperature**	**2bytes**	**C,W**	**7.600 absolute colour temperature(K)**
This communication object is used to set the absolute colour temperature of the group. Range is 0..65535K.					
33	**Output X - Group y{{...}}**	**Relative percentage colour temperature**	**1byte**	**C,W**	**5.001 percentage(0..100%)**
This communication object is used to control the relative colour temperature via a percentage object type.					
33	**Output X - Group y{{...}}**	**RGB colour value** **RGBW colour value** **HSV Hue(H) value** **Colour XY value** **Colour X value**	**3byte** **6byte** **1byte** **6byte** **2byte**	**C,W**	**232.600 RGB value 3x(0..255)** **251.600 RGBW value 4x(0...100%)** **5.003 angle(degrees)**

					242.600 Colour xyY **7.001 pulses**
34	**Output X - Group y{{...}}**	**HSV Saturation(S) value** **Colour Y value**	**1byte** **2byte**	**C,W**	**5.001 percentage(0..100%)** **7.001 pulses**
35	**Output X - Group y{{...}}**	**White colour value**	**1byte**	**C,W**	**5.001 percentage(0..100%)**

Displays objects according to the colour control type. Used for broadcasting colour control.

RGB colour value: Setting the RGB value

RGBW colour value: Setting the RGBW value

HSV Hue(H) value: Setting the HSV Hue(H) value

Colour XY value: Setting the XY value

Colour X value:Setting the X value

HSV Saturation(S) value: Setting the HSV Saturation(S) value

Colour Y value:Setting the Y value

White colour value: Setting the White colour value

36	**Output X - Group y{{...}}**	**Relative colour Temperature**	**4bit**	**C,W**	**3.007 dimming control**

The communication object adjusts the colour temperature of the group by relative dimming. The telegram value refers to object 29.

The new color temperature value is calculated relative to the current color temperature value, for example, if the color temperature value is 9000K and is increase 50%, the new color temperature value will be 4500K, as follows:

Telegram value	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Decrease the colour	stop	(100%)	(50%)	(25%)	(12%)	(6%)	(3%)	(1%)

temperature value								
Telegram value	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Increase the colour temperature value	stop	(100%)	(50%)	(25%)	(12%)	(6%)	(3%)	(1%)

Note: In the DALI system,stop Relative Control is supported.

36	**Output X - Group y{{...}}**	**Relative HSV Hue(H) value**	**4bit**	**C,W**	**3.007 dimming control**
37	**Output X - Group y{{...}}**	**Relative HSV Saturation(S) value**	**4bit**	**C,W**	**3.007 dimming control**
38	**Output X - Group y{{...}}**	**Relative white colour value**	**4bit**	**C,W**	**3.007 dimming control**
Displaying objects according to colour control type. Used for relative adjustment of colour.					
40	**Output X - Group y{{...}}**	**Absolute colour temperature, status**	**2byte**	**C,R,T**	**7.600 absolute colour temperature**
This communication object is used to send the current absolute colour temperature value of the group to the bus.					
40	**Output X - Group y{{...}}**	**Relative percentage colour temperature, status**	**1byte**	**C,R,T**	**5.001 percentage(0..100%)**
This communication object sends the relative colour temperature status as a percentage to the bus.					

40	**Output X - Group y{{...}}**	**RGB colour value, status RGBW colour value, status HSV Hue(H) value, status Colour XY value, status Colour X value, status**	**3byte 6byte 1byte 6byte 2byte**	**C,R,T**	**232.600 RGB value 3x(0..255) 251.600 RGBW value 4x(0...100%) 5.003 angle(degrees) 242.600 Colour xyY 7.001 pulses**
41	**Output X - Group y{{...}}**	**HSV Saturation(S) value, status Colour Y value, status**	**1byte 2byte**	**C,R,T**	**5.001 percentage(0..100%) 7.001 pulses**
42	**Output X - Group y{{...}}**	**HSV Saturation(S) value, status**	**1byte**	**C,R,T**	**5.001 percentage(0..100%)**
42	**Output X - Group y{{...}}**	**White colour value, status**	**1byte**	**C,R,T**	**5.001 percentage(0..100%)**
Displaying objects according to colour control type. Used to send status in various colour					
43	**Output X - Group y{{...}}**	**KNX Scene**	**1byte**	**C,W**	**18.001 scene control**

The communication object is visible when “Group scene function” is enable.Used to recall or store a global scene. Up to 16 scenes are available for the DALI gateway. The KNX scene number is defined as follows:

Set an 8bit instruction as (binary code): FXNNNNNN

F: call the scene for '0'; store the scene for '1';

X:0;

NNNNNN: Scene number (0...63).

The parameter setting option is 1~64. In fact, the scene telegram received by the communication object "Scene" corresponds to 0~63. As follows：

Scene number	Call the message value of the scene object	Store the message value of the scene object
Scene 1	0	128
Scene 2	1	129
Scene 3	2	130
…	…	…
Scene 64	63	191

Such as setting the scene 1 of this parameter, the scene telegram received by the communication object "Scene" should be 0.

Table 6.3 “X: Group” Communication object

6.4 Channel Communication Object of a Single DALI Device

There are 64 DALI devices in the channel. The communication objects of each DALI device are the same and independent of each other. The following is an example of one of the devices:

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
315	Output A ECG 1-...	Disable function			1 bit	C	-	W	-	-	enable	Low
316	Output A ECG 1-...	Switch			1 bit	C	-	W	-	-	switch	Low
317	Output A ECG 1-...	Relative dimming			4 bit	C	-	W	-	-	dimming control	Low
318	Output A ECG 1-...	Brightness dimming			1 byte	C	-	W	-	-	percentage (0..100%)	Low
319	Output A ECG 1-...	Switch status			1 bit	C	R	-	T	-	switch	Low
320	Output A ECG 1-...	Brightness status			1 byte	C	R	-	T	-	percentage (0..100%)	Low
321	Output A ECG 1-...	Reset Operating hours			1 bit	C	-	W	-	-	reset	Low
322	Output A ECG 1-...	Operating hours			4 bytes	C	R	-	T	-	time lag (s)	Low
323	Output A ECG 1-...	Life time exceeded			1 bit	C	R	-	T	-	alarm	Low
324	Output A ECG 1-...	ECG/Lamp Failure status			2 bytes	C	-	-	T	-	diagnostic value	Low

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325	Output A ECG 1-...	Relative percentage colour temperature			1 byte	C	-	W	-	-	percentage (0..100%)	Low
328	Output A ECG 1-...	Relative colour Temperature			4 bit	C	-	W	-	-	dimming control	Low
332	Output A ECG 1-...	Relative percentage colour temperature, status			1 byte	C	R	-	T	-	percentage (0..100%)	Low

ECG with Colour control_RGB(Combined object)

325	Output A ECG 1-...	RGB colour value			3 bytes	C	-	W	-	-	RGB value 3x(0..255)	Low
332	Output A ECG 1-...	RGB colour value, status			3 bytes	C	R	-	T	-	RGB value 3x(0..255)	Low
325	Output A ECG 1-...	HSV Hue(H) value			1 byte	C	-	W	-	-	angle (degrees)	Low
326	Output A ECG 1-...	HSV Saturation(S) value			1 byte	C	-	W	-	-	percentage (0..100%)	Low
328	Output A ECG 1-...	Relative HSV Hue(H) value			4 bit	C	-	W	-	-	dimming control	Low
329	Output A ECG 1-...	Relative HSV Saturation(S) value			4 bit	C	-	W	-	-	dimming control	Low
332	Output A ECG 1-...	HSV Hue(H) value, status			1 byte	C	R	-	T	-	angle (degrees)	Low
333	Output A ECG 1-...	HSV Saturation(S) value, status			1 byte	C	R	-	T	-	percentage (0..100%)	Low

ECG with Colour control_HSV(Separated objects)

325	Output A ECG 1-...	RGBW colour value			6 bytes	C	-	W	-	-	RGBW value 4x(0..100%)	Low
332	Output A ECG 1-...	RGBW colour value, status			6 bytes	C	R	-	T	-	RGBW value 4x(0..100%)	Low

ECG with Colour control_RGBW(Combined object)

325	Output A ECG 1-...	HSV Hue(H) value			1 byte	C	-	W	-	-	angle (degrees)	Low
326	Output A ECG 1-...	HSV Saturation(S) value			1 byte	C	-	W	-	-	percentage (0..100%)	Low
327	Output A ECG 1-...	White colour value			1 byte	C	-	W	-	-	percentage (0..100%)	Low
328	Output A ECG 1-...	Relative HSV Hue(H) value			4 bit	C	-	W	-	-	dimming control	Low
329	Output A ECG 1-...	Relative HSV Saturation(S) value			4 bit	C	-	W	-	-	dimming control	Low
331	Output A ECG 1-...	Relative white colour value			4 bit	C	-	W	-	-	dimming control	Low
332	Output A ECG 1-...	HSV Hue(H) value, status			1 byte	C	R	-	T	-	angle (degrees)	Low
333	Output A ECG 1-...	HSV Saturation(S) value, status			1 byte	C	R	-	T	-	percentage (0..100%)	Low
334	Output A ECG 1-...	White colour value, status			1 byte	C	R	-	T	-	percentage (0..100%)	Low

ECG with Colour control_HSVW(Separated objects)

325	Output A ECG 1-...	Colour X value			2 bytes	C	-	W	-	-	pulses	Low
326	Output A ECG 1-...	Colour Y value			2 bytes	C	-	W	-	-	pulses	Low
332	Output A ECG 1-...	Colour X value, status			2 bytes	C	R	-	T	-	pulses	Low
333	Output A ECG 1-...	Colour Y value, status			2 bytes	C	R	-	T	-	pulses	Low

ECG with Colour control_XY Colour

Fig.6.4 “X: ECG” Communication object

NO.	Name	Object function	Types	Attributes	DPT
315	**Output X - ECG y{{...}}**	**Disable function**	**1bit**	**C,W**	**1.003 enable**
The communication object is visible when “Disable function” is enable.Used for ECG disable/enable control, the trigger value is defined by the parameter, the device reboot is enabled by default. The name in parentheses changes with the parameter “Description (max 30char.)”. If description is empty, display “Output X - ECG y{{...}}” by default. The same below.					
316	**Output X - ECG y{{...}}**	**Switch**	**1bit**	**C,W**	**1.001 Switch**
This communication object is not visible when the operation mode is "Permanent mode". Used to open or close the group, y=1..16. The value for "Switch on" can be defined by a parameter template. See section 5.4.1 for details.					
317	**Output X - ECG y{{...}}**	**Relative dimming**	**4bit**	**C,W**	**3.007 dimming control**
This communication object is used for relative dimming of the ECG. The highest bit Bit4 decides to brighten or darken, Bit 0..3 determines the dimming size, and Bit 0..3 is 0 to stop dimming. Refer to object 29 for the correspondence between the value of the relatively dimmed telegram and the change in brightness.					
318	**Output X - ECG y{{...}}**	**Brightness value**	**1byte**	**C,W**	**5.001 percentage(0..100%)**
This communication object is not visible when the operation mode is "Permanent mode".Used to set the brightness value of the ECG.					
319	**Output X - ECG y{{...}}**	**Switch status**	**1bit**	**C,R,T**	**1.001 Switch**
This communication object is used to send the switch status of the ECG.					
320	**Output X - ECG y{{...}}**	**Brightness**	**1byte**	**C,R,T**	**5.001 percentage(0..100%)**

		status			
This communication object is used to send the brightness status of the ECG.					
321	**Output X - ECG y{{...}}**	**Reset Operating hours**	**1bit**	**C,W**	**1.015 reset**
This communication object is used to reset the operating hours of the lamp to 0.					
322	**Output X - ECG y{{...}}**	**Operation hours**	**4byte**	**C,R,T**	**13.100 time lag(s)**
This communication object is used to send the operation hours of the lamp. Time unit: seconds. Send once every hour. **Note: This object supports the write count time or the reset count time to 0, but the W attribute needs to be set via ETS. Normally, W does not set.**					
323	**Output X - ECG y{{...}}**	**Life time exceeded**	**1bit**	**C,R,T**	**1.005 alarm**
This object sends status information when the operation hours of the lamp exceeds the life time limit of the parameter configuration.					
324	**Output X - ECG y{{...}}**	**ECG/Lamp Failure status**	**1bit 1byte 2byte**	**C, R,T**	**1.005 alarm 238.600 DALI Diagnostics 237.600 DALI_Control_Gear_ Diagnostics**
Displayed according to the parameter Object type of ECG /Lamp failure. Used to send failure status of the lamp and ECG.					

Table 6.4 “X: ECG” Communication object

Note: Communication objects 325-336 are similar to the objects in Section 6.3 and are not repeated here.